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UNITED STATES PATENT AND TRADEMARK OFFICE

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April 23, 1985

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U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

April 23, 1985 Volume 1053 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 25/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

Note that the amount of the international search fee for the European Patent Office will change effective May 7, 1985 and the amounts of the International PCT fees will change effective May 28, 1985. For information on these fee changes see the notice appearing in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 20, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Apr. 20, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,325,148 through 4,326,298

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,736,107, Re. S.N. 597,582, Filed Apr. 19, 1984, Cl. 428/336, COATED CEMENTED CARBIDE PRODUCT, Thomas E. Hale, Owner of Record: *General Elec-*

tric Co., Attorney or Agent: Joseph B. Forman, Ex. Gp.: 131

3,858,793, Re. S.N. 302,402, Filed Sept. 15, 1981, Cl. 494/60, CARTRIDGE CENTRIFUGE, Denis J. Dudrey, Owner of Record: *Donaldson Co., Inc., Minneapolis, Minn.*, Attorney or Agent: John D. Gould, et al., Ex. Gp.: 242

3,937,283, Re. S.N. 703,149, Filed Feb. 19, 1985, Cl. 166/307, FORMATION FRACTURING WITH STABLE FOAM, Roland E. Blauer, et al., Owner of Record: *Scientific Software Corp., Denver, Colo.*, Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 356

4,223,970, Re. S.N. 663,817, Filed Oct. 22, 1984, Cl. 339/221, COMPLIANT BACKPLANE ELECTRICAL CONNECTOR, Leo Walter, et al., Owner of Record: *Electronics Stamping Corp., Compton, Calif.*, Attorney or Agent: William W. Haefliger, Ex. Gp.: 322

4,246,904, Re. S.N. 461,297, Filed Jan. 27, 1983, Cl. 313/99, SURGICAL SUTURE DERIVED FROM SEGMENTED POLYETHER-ESTER BLOCK COPOLYMERS, Donald S. Kaplan, Owner of Record: *American Cyanamid Co., Stamford, Conn.*, Attorney or Agent: Charles F. Costello, Jr., Ex. Gp.: 256

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,815,764, Reexam. No. 90/000,745, Requested: Mar. 21, 1985, Cl. 414/513, LOAD BODY WITH LOAD COMPACTING AND EJECTING BLADE, William C. Gilfillan, et al., Owner of Record: *Saul R. Spector, Pottsville, Pa.*, Attorney or Agent: Harvey B. Jacobson, Ex. Gp.: 310, Requester: Harsco Corp., Camp Hill, Pa.

3,893,462, Reexam. No. 90/000,738, Requested: Mar. 11, 1985, Cl. 128/421, BIOELECTROCHEMICAL REGENERATOR AND STIMULATOR DEVICES AND METHODS FOR APPLYING ELECTRICAL ENERGY TO CELLS AND/OR TISSUE IN A LIVING BODY, Michael R. Manning, Owner of Record: *ESB, Inc., Philadelphia, Pa.*, Attorney or Agent: Anthony J. Rossi, Ex. Gp.: 335, Requester: Electro-Biology, Inc., Washington, D.C.

4,017,652, Reexam. No. 90/000,743, Requested: Mar. 21, 1985, Cl. 427/54.1, PHOTOCATALYST SYSTEM AND ULTRAVIOLET LIGHT CURABLE COATING COMPOSITIONS CONTAINING THE SAME, Gerald W. Gruber, Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.*, Attorney or Agent: Russell A. Eberly, Ex. Gp.: 150, Requester: Upjohn Co., Kalamazoo, Mich.

4,301,302, Reexam. No. 90/000,742, Requested: Mar. 15, 1985, Cl. 568,373, TETRAALKYL SUBSTITUTED TRICYCLIC KETONE, Mark A. Sprecker, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.*, Attorney or Agent: Arthur L. Liberman, Ex. Gp.: 126, Requester: International Flavors & Fragrances, New York, N.Y.

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

Jan. 10, 1985.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Princess Peggy, Inc., Peoria, Ill., Reg. No. 805,995, for the mark "NO-GAP", Canc. No. 14,344.

Extec Corp., d.b.a. Health Headquarters, Castleton, Ind., Reg. No. 1,125,912, for the mark "ARTHRON", Canc. No. 14,402.

Crimefighter Systems, Inc., Hallandale, Fla., Reg. No. 1,206,494, for the mark "CRIMEFIGHTER", Canc. No. 14,572.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,341,730, Goodrich and Ignatowski, ELECTRON MULTIPLIER WITH MULTIPLYING PATH WALL MEANS HAVING A REDUCES REDUCIBLE MENTAL COMPOUND CONSTITUENT; **4,227,087,** Edward A. Kurz, BEAN DETECTOR, **filed** May 15, 1984, D.C. Mass. (Springfield), Doc. 84–0187–G, *Galileo Electro-Optics Corp.* v. *Detector Technology, Inc.*

3,343,506, Buchbinder and Duignan, FOUR POST SHELVING WITH INSERTABLE SHELVES, **filed** Sept. 24, 1984, D.C., M.D. Fla. (Tampa), Doc 84–1271–Civ–T–15, *Ardco, Inc.* v. *Commercial Refrigerator Door Co.*

3,378,633, Albert Macovski, MONOCHROME PHOTOGRAPHY SYSTEM FOR COLOR TELEVISION; **37,491,** same, PHOTOGRAPHY USING SPATIAL FILTERING, **filed** July 19, 1982, D.C., N.D. Calif. (San Francisco), Doc. C82–3625 WWS, *S R I International* v. *Matsushita Electric Corp. of America.*

3,425,080, Doilitzsch and Skirde, WASHING APPARATUS FOR VEHICLES, MORE PARTICULARLY FOR MOTOR VEHICLES, **filed** Dec. 1, 1981, D.C., E.D. Mich. (Ann Arbor), Doc. 81–60241, *OY Electrolux AB Tammermatic* v. *Lamminen Wash Systems, Inc.* Plaintiff filed a complaint charging defendants with patent infringement, filed Aug. 28, 1984.

3,430,612, John J. Ansteth, ROCKER ARM STUD GIRDLE, **filed** Oct. 12, 1984, D.C., W.D. Mich. (Grand Rapids), Doc. G84–1161–CA1, *John J. Ansteth* v. *Abacus Acceptance Co., Inc., a Mich. Corp., d/b/a Baker Engineered Racing Engines & Components.*

3,579,127, Technologies, Inc., APPARATUS FOR MONITORING PULSES, **filed** Mar. 1, 1984, D.C., S.D. Calif. (San Diego), Doc. 84–0541–K (M), *GA Technologies, Inc.* v. *Gamma-Metrics, et al.* This case is hereby dismissed with prejudice as to all parties, each party to bear his own costs and fees, filed Aug. 22, 1984.

3,595,141, The D.C. Brown Co., PAVEMENT AND BRIDGE JOINT SEALS, **filed** Sept. 2, 1983, D.C., E.D. Mo. (St. Louis), Doc. N83–0098C, *The D.S. Brown Co.* v. *The Huntington Rubber Corp.* This action is hereby dismissed without prejudice, each party to bear its own costs, filed Mar. 27, 1984.

3,609,014, Arthur W. Kurz, ELECTRIC REMOTE CONTROL REAR VIEW MIRROR, filed Aug. 16, 1984, D.C., W.D. Mich. (Grand Rapids), Doc. G84–926 CA1, *NI Industries, Inc.* v. *Lowell Engineering Corp.*

3,618,898, Elmer L. Notestine, WINCH, **filed** Sept. 14, 1984, D.C. Oreg. (Portland), Doc. CV 84–1045, *Elmer L. Notestine* v. *Tensen Co., Inc., et al.*

3,649,532, John O. McLean, METHOD OF TREATING WATER, **filed** Jan. 7, 1983, D.C., S.D. Ohio (Columbus), Doc. C–2–83–70, *Chemical Engineering Corp.* v. *William R. Hague, Inc.* **Same, filed** Oct. 14, 1982, D.C., N.D. Ind. (Fort Wayne), Doc F–82–417, *Chemical Engineering Corp.* v. *Essef Industries, Inc.*

3,651,734, Thomas W. McSherry, EXPANSIBLE FASTENER, **filed** Aug. 10, 1984, D.C. Conn. (Hartford), Doc. H 84 880, *Mechanical Plastics Corp.* v. *Emhart Industries, Inc.*

3,692,155, Joseph N. Laurita, LUGGAGE HANDLE; **D. 220,819,** same, HANDLE ASSEMBLY, **filed** Mar. 1, 1984, D.C., S.D.N.Y., Doc. 84–Civ–1465(WK), *CPG Products Corp.* v. *M/M Verdi International, Inc.*

3,709,552, Boalloy Ltd., VAN BODIES, **filed** Aug. 22, 1984, D.C., N.D. Tex. (Fort Worth), Doc. CA4–84–347 K, *Boalloy Ltd.* v. *Aztec Don-Bur Products, Inc.*

3,751,014, Graham Engineering Corp., APPARATUS FOR EXTRUDING SYNTHETIC PLASTIC RESINS AT LOW TEMPERATURES; **3,866,669,** Crompton & Knowles Corp., EXTRUDER AND TEMPERATURE CONTROL APPARATUS THEREFOR; **4,262,737,** Crompton & Knowles Corp., EXTRUDER TEMPERATURE CONTROLLER, **filed** May 10, 1982, D.C., S.D.N.Y., Doc. 82–Civ–2972, *Eurotherm Corp.* v. *Crompton & Knowles Corp.* Action settled on July 18, 1984.

3,757,087, Smiths Industries, Ltd., HEATING ELEMENTS, **filed** Mar. 30, 1978, D.C.N.J. (Newark), Doc. 78–647, *Interdynamics, Inc., et al.* v. *Firma Wolf, et al.* Stipulation and Order transferring action to E.D.N.Y. (Ackerman), filed Aug. 21, 1984.

3,772,065, Dynamit Nobel Aktiengesellschaft, METHOD FOR WATERPROOFING MASONRY STRUCTURERS, **filed** June 13, 1984, D.C., W.D. Okla. (Oklahoma City), Doc. CIV 84–1456–R, *Advanced Chemical Technologies, Inc.* v. *Dynamit Nobel Aktiengesellschaft.*

3,775,552, AMP, Inc., MINIATORE COAXIAL CABLE ASSEMBLY, **filed** Nov. 12, 1982, D.C. Del. (Wilmington), Doc. 82–734, AMP, Inc. v. *W. L. Gore & Ass., Inc.* Stipulation of dismissal, filed July 29, 1983.

3,780,502, Dupre and DeMarco, COLLECTOR APPARATUS; **4,111,670,** Thomas M. DeMarco, TRUCK MOUNTED SEPARATOR APPARATUS, **filed** Oct. 10, 1983, D.C., N.D. Ala. (Birmingham), Doc. 83–AR–2506–S, *NFE International, Ltd.* v. *Guzzler Manufacturing, Inc.* Action dismissed with prejudice, filed Sept. 11, 1984.

3,817,492, Paul Raymer, MESSAGE EDGED PAD, **filed** Apr. 10, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84–2497, *Brothers Printing Co., Inc.* v. *Linn Erickson, et al.* Defendant is permanently restrained and enjoined from directly or indirectly using and making advertisements of patent, filed Aug. 28, 1984.

3,824,796, Charles L. Nasby, Jr., MOBILE DOCK STRUCTURE, **filed** Oct. 10, 1984, D.C. Minn. (St. Paul), Doc. 3–84–1369, *Span-Dock, Inc.* v. *Bob's Machine & Manufacturing Co.*

3,906,820, Ernest D. Hauk, APPARATUS AND METHOD FOR SPINNING PIPE; **4,099,429,** same, PIPE-SPINNING APPARATUS AND METHOD, **filed** Oct. 1, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84–7433ER(Bx), *Hawk Industries, Inc.* v. *Klampon Corp.*

3,915,464, William Berry, FULCRUM DEVICE, **filed** Aug. 31, 1984, D.C., E.D.N.Y. (Uniondale), Doc. CV–84–3624 LDW, *Braberry Sales Corp.* v. *National Distribution, Inc., et ano.*

3,938,520, Abbott Laboratories, TRANSFER UNIT HAVING A DUAL CHANNEL TRANSFER MEMBER, **filed** Aug. 24, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84 6341, *Abbott Laboratories,* v. *IMS, Ltd.*

3,955,728, Jackson and Bohm, HANDLEBAR BAG, **filed** Sept. 4, 1984, D.C., E.D. Mich. (Ann Arbor), Doc. 84–CV–7413–AA, *Eclipse, Inc.* v. *Wilderness, Group, Inc.*

3,968,559, AB Volvo, et al., METHOD AND ARRANGEMENT FOR ASSEMBLY OF COMPONENT PARTS, PREFERABLE FOR MOTOR VEHICLES, **filed** Sept. 27, 1984, D.C., N.D. Ohio (Cleveland), Doc. C84–3095, *AB Volvo, et al.* v. *Eaton-Kenway, Inc.*

3,971,656, Teledyne Industries, Inc., CARBONITRIDE ALLOYS FOR TOOL AND WEAR APPLICATIONS, **filed** Aug. 27, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 7376, *Teledyne Industries, Inc.* v. *Sumiden Carbide America, Inc.*

4,074,447, Shivers, Jr., et al., STUMP CUTTING AND PRECISION DIGGING APPARATUS, **filed** July 15, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 4567 LEW(Gx), *Paul N. Shivers, et al.* v. *Arrowhead Continental, Inc.* Action dismissed with prejudice and each party to bear own costs, filed Sept. 17, 1984.

4,074,803, Tri Star Industries, Ltd., SEMICONDUCTOR RECTIFIER DEVICE, **filed** July 18, 1984, D.C. Minn. (Minneapolis), Doc. 4–84–Civil 734, *Sunds Defibrator, Inc.* v. *Tri Star Industries, Ltd.*

4,096,523, Corporate Communications Consultants, Inc., COLOR CORRECTION SYSTEM, **filed** Aug. 20, 1984, D.C., M.D. Fla. (Orlando), Doc. 84–633–Civ–Orl–18, *Corporate Communications Consultants, Inc.* v. *Digital Video Corp., et al.*

4,096,523, Corporation Communications Consultants, Inc., COLOR CORRECTION SYSTEM; **4,410,918,** same, HELICAL SCAN W.T.R. WITH DEFLECTABLE HEAD, **filed** Aug. 3, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 6700, *Corporate Communications Consultants, Inc.* v. *Edit/Chicago, Inc.*

4,099,429. **(See 3,906,820.)**

4,147,044, A & B Safe Corp., SAFE DOOR LOCKING ARRANGEMENT, **filed** Aug. 28, 1984, D.C., N.D. Ill. (Chicago), Doc. 84C7431, *A & B Safe Corp.* v. *Jae Sung Chang.*

4,152,922, Edward E. Francisco, APPARATUS AND METHOD FOR DETERMINING THE CHARACTERISTIC OF A FLOWMETER, **filed** Aug. 24, 1984, D.C. Tex. (Corpus Christi), Doc. 84–199, *Emerson Electric Co. & Flow Technology, Inc.* v. *Smith Meter, Inc.*

4,176,921, Jan H. Matthias, EYEGLASSES HAVING REMOVABLE LENSES, **filed** May 15, 1984, D.C. Fla. (W. Palm Beach), Doc. 84–1229–CIV–JCP, *Optyl Eyewear Fashions International* v. *Dynasty Optical Industries.* **Same, filed** June 11, 1984, D.C.N.J. (Newark), Doc. Civ 84–2283, *Optyl Eyewear Fashions International Corp.* v. *Viva Optique, Inc.*

4,181,955, Mathematical Applications Group, Inc., APPARATUS FOR PRODUCING PHOTOGRAPHIC SLIDES, **filed** July 9, 1984, D.C., S.D.N.Y., Doc. Civ 84–2677D, *Mathematical Applications Group, Inc.* v. *Accm. Communication Industries, Inc.*

4,183,157, Clarence J. Counselman, OVERSHOES FOR SPIKED SHOES, **filed** Oct. 1, 1982, D.C., W.D. Pa. (Pittsburgh), Doc. 82–2044, *ACS Hospital Systems, Inc.* v. *Wells National Services Corp.* It is hereby stipulated that this case may be dismissed with prejudice, each party to bear its own costs, filed Sept. 25, 1984.

4,194,509, Pickering & Ferguson, PRECONNECTED CATHETER DRAINAGE SYSTEM, **filed** Aug. 13, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84 6043, *C.R. Brad, Inc.* v. *American Hospital Supply Corp.*

4,211,426, Everest & Jennings, Inc., WEIGHT RELIEVING AMBULATOR, **filed** Dec. 13, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 7934, *Everest & Jennings, Inc.* v. *L. Mulholland Corp.* This action was dismissed with prejudice on Sept. 11, 1984

4,218,104, Anderson and Crennan, REFRIGERATION INSULATION PANEL AND STRUCTURE; **Re. 31,328,** same, **filed** Sept. 19, 1984, D.C., N.D. Iowa (Cedar Rapids), Doc. C 84–1035, *Insul-Aids Products, Inc.* v. *Frommelt Industries, Inc.*

4,218,227, Robert E. Frey, DUST COLLECTOR, **filed** Nov. 17, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 6408, *Donaldson Co., Inc.* v. *Farr Co.*

4,221,013, Angel M. Echevarria, FLUID FLOTATION SLEEP SYSTEM, **filed** Oct. 2, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84 7498, *Somma Mattress* v. *Diamond Mattress Co., Inc.*

4,227,087. (See 3,341,730.)

4,234,649, Commercial Affiliates, Inc., BINDER MATERIAL SEAM, **filed** Sept. 17, 1984, D.C., S.D. Ohio (Columbus), Doc. C–2–84–1688, *Lewis McDermott* v. *Omid International, Inc.*

4,243,464, Thomas M. & Jessie M. Potchen, LAMINATING METHOD, **filed** Oct. 12, 1984, D.C., M.D. Fla. (Orlando), Doc. 84–789–Civ–Orl–11, *Thomas M. & Jessie M. Potchen* v. *Hymmen GmbH & Laminex, Inc.* **Same, filed** Oct. 12, 1984, D.C., M.D. Fla. (Orlando), Doc. 84–790–ORL–CIV–11, *Thomas M. & Jessie M. Potchen* v. *North Branch Lumber Co.* **Same, filed** Oct. 12, 1984, D.C., M.D. Fla. (Orlando), Doc. 84–791–Civ–Orl–11, *Thomas M. & Jessie M. Potchen* v. *Barberan.*

4,259,676, Peter C. & David M. Salmon, THERMAL PRINT HEAD, **filed** Sept. 25, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84 7207, *Kyocera Corp., et al.* v. *Santek, Inc.*

4,265,393, Edgar L. Orchard, BOX CONSTRUCTION, **filed** Mar. 7, 1984, D.C., E.D. Mo. (St. Louis), Doc. 84–0566C(2), *Orco Sales Co., Inc.* v. *Arvco Container Corp.* The Defendant has infringed the patent by manufacturing and selling a pizza box which incorporates the claimed subject matter, plaintiff is the owner, filed Oct. 5, 1984

4,313,112, Daniel F. Foster, COMPUTER WORK STATION ASSEMBLY AND MOUNTING APPARATUS THEREFORE, **filed** Feb. 3, 1983, D.C., N.D. Ala. (Birmingham), Doc. CV83–G–0287–S, *Input-Ez Corp.* v. *Health Science Products, Inc., d/b/a HSP Computer Furniture.* Judgment filed on Aug. 29, 1984

4,315,763, Stoller and Hartung, HIGH ANALYSIS LIQUID FERTILIZERS, **filed** Sept. 6, 1984, D.C. Idaho (Boise), Doc. 84–4124, *Stoller Enterprises, Inc.* v. *Jay Beck.* **Same, filed** Sept. 7, 1984, D.C. Idaho (Boise), Doc. 84–4125, *Stoller Enterprises, Inc.* v. *Weldon Baker.* **Same, filed** Sept. 28, 1984, D.C. Mont. (Billings), Doc. CV 84–242–H, *Stoller Enterprises, Inc.* v. *N & P Fertilizer, Inc.* **Same, filed** Sept. 28, 1984, D.C. Mont. (Billings), Doc. CV 84–243–Blg, *Stoller Enterprises, Inc.* v. *Ferti-Chem, Inc.*

4,327,133, Lever Brothers Co., ADDITIVES FOR CLOTHES DRYERS; **4,421,792,** same, **filed** Oct. 9, 1984, D.C.N.J. (Newark), Doc. 84–4188, *Lever Brothers Co.* v. *The Procter & Gamble Co., et al.*

4,328,404, Frankl & Kirchner GmbH & Co. KG, ACTUATION APPARATUS FOR A CONTROL SWITCH; **4,361,350,** same, SECURING DEVICE FOR A HOUSING COVER ELEMENT, ESPECIALLY FOR SWITCH BOXES HAVING ELECTRICAL SWITCHING SERVICES, **filed** Sept. 28, 1984, D.C., E.D. Pa. (Pennsylvania), Doc. 84–4660, *Frankl & Kirchner GmbH & Co. KG* v. *Teledyne, Inc.*

4,332,557, Takara Co., DENTAL OPERATORY SYSTEM; **Re. 31,548,** same, **filed** Apr. 4, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 2874, *Takara Co.* v. *Adenca, Inc.* Cause dismissed, with prejudice, defendant having paid cost per final judgment, filed Oct. 9, 1984

4,361,142, Jack L. Lewis, KNEE ORTHOSIS AND JOINT CONSTRUCTION THEREFOR, **filed** Oct. 10, 1984, D.C., E.D. Ill. (Chicago), Doc. 84 C 8768, *Ballert Orthopedic Corp.* v. *Orthotic-Prosthetic Laboratory Services, Inc., et al.*

4,361,350. (See 4,328,404.)

4,371,580, Morrison Co., Inc. THREE-PLY BELTING MATERIAL, **filed** Sept. 19, 1984, D.C. Kansas (Wichita), Doc. 84–1675, *Morrison Co., Inc.* v. *The Goodyear Tire & Rubber Co., Inc.*

4,377,507, The Marley-Wylain Co., CONTAINING NUCLEAR WASTE VIA CHEMICAL POLYMERIZATION, **filed** Sept. 21, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84 7226, *Precolite, a division of U.S. Industries, Inc.* v. *GTY Industries*

4,381,785, Reliance Products Corp., BABY PACIFIER, **filed** Oct. 3, 1984, D.C., N.D. Calif. (San Francisco), Doc. C84–6442, *Reliance Products Corp.* v. *Questor Corp.*

4,387,440, Michael D. Eaton, MODEM CONTROL DEVICE CODE MULTIPLEXING, **filed** Feb. 16, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 1431, *U.S. Robotics, Inc.* v. *Business Computor Corp., et al.* The court enters an order transferring this case to the Northern District of California, filed Sept. 17, 1984

4,392,760, Rudolph E. Futer, SURFACE FLOW AIR CONVEYOR WITH PLENUM MOUNTED FAN

WHEEL, filed Aug. 17, 1984, D.C., N.D. Calif. (San Francisco), Doc. C–84–5881SC, *Futerized Systems, Inc.* v. *Pack Air, Inc. et al.*

4,401,258, Villeroy & Boch Keramische Werke KG, LETTER CARD AND CONFINING MEANS THEREFOR, **filed** July 6, 1984, D.C., S.D.N.Y., Doc. 84–Civ–4773 (LBS), *Villeroy & Boch Keramische Werke KG* v. *Papel, Inc.*

4,401,335, Byron L. Godbersen, BOAT HOIST, **filed** Nov. 17, 1983, D.C., W.D. Mich. (Grand Rapids), Doc. G83–1354CA1, *Byron L. Godbersen* v. *Harbor, Ltd.* Consent judgment filed on May 9, 1984.

4,402,300, Philip I. Houck, COOKING UNIT, METHOD, AND BURNER ASSEMBLY FOR GRILLING LARGE QUANTITIES OF FOOD, **filed** Aug. 21, 1984, D.C. Del. (Wilmington), Doc. 84–457, *Philip I. Houck* v. *David L. Canby d/b/a/ Canby's.*

4,402,391, Golden Recycle Co., SELECTIVE SCRAP METAL COLLECTION APPARATUS, **filed** Sept. 7, 1984, D.C. Colo. (Denver), Doc. 84–Z–1803, *Golden Recycle Co.* v. *Creative Technology, Inc.*

4,410,918. (See 4,096,523.)

4,111,670. (See 3,780,502.)

4,418,944, Stephen W. Haines, et al., FLUID COUPLING, **filed** Aug. 15, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84–6025–ER (Bx), *Cooper Vision, Inc.* v. *Alcon Laboratories, Inc.*

4,421,792. (See 4,327,133.)

4,431,634, American Cyanamid Co., PRENATAL IRON SUPPLEMENTS, **filed** Oct. 5, 1984, D.C.N.J. (Newark), Doc. 84–4167, *American Cyanamid Co.* v. *Amide Pharaceutical, Inc.*

4,441,021, Snap-On Tools Corp., LUMINOSITY PROBE FOR DIESEL ENGINE TIMING APPARATUS, **filed** Oct. 4, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 8640, *Snap-On Tools Corp.* v. *Sun Electric Corp.*

4,452,698, U.S. Environmental Products, Inc., RIGID FILTER PLATE AND PROCESS FOR MANUFACTURE OF THE SAME, **filed** Sept. 12, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 7882, *U.S. Environmental Products, Inc.* v. *Infilco Degrement, Inc.*

4,457,201, David C. Storey, COMBINED BRIDGE AND TAILPIECE ASSEMBLY FOR A STRINGED MUSICAL INSTRUMENT, **filed** Oct. 9, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 8711, *David C. Storey, et al.* v. *Westheimer Corp.*

Re. 27,491. (See 3,378,633.)

Re. 30,308, Lloyd D. Masser, SUSPENSION STRUCTURE FOR AUTOMOTIVE VEHICLES, **filed** July 19, 1984, D.C., E.D. Mich. (Detroit), Doc. 84 CV3353DT, *Lear Siegler, Inc.* v. *Turner Quick Lift Corp.*

Re. 31,328. (See 4,218,104.)

Re. 31,548. (See 4,332,557).

D. 220,819. (See 3,692,155.)

D. 224,029, Learning Products, Inc., JUVENILE PLAY STRUCTURE OR SIMILAR ARTICLE, **filed** Oct. 2, 1984, D.C., E.D. Mo. (St. Louis), Doc. 84–2335C(4), *Learning Products, Inc.* v. *Rotoplas, Ltd.*

D. 251,292, Coachmen Industries, Inc. TOP FOR AN AUTOMOTIVE VAN, **filed** Mar. 19, 1984, D.C., N.D. Ind. (Ft. Wayne), Doc. F 84–103, *Coachmen Industries, Inc.* v. *Fawn River Plastics, Inc.*

D. 268,275. (See 4,335,538.)

D. 268,490, Mills and Egan, MOTORCYCLE TIRE; **D. 269,263,** Barrington S. Gill, TIRE FOR A VEHICLE WHEEL, **filed** Jun. 22, 1984, D.C., M.D. Fla. (Tampa), Doc. 84–842–Civ–T–15, *Dunlop Tire and Rubber Corp.* v. *Rebel International, Inc.*

Department of the Treasury
United States Customs Service

Application for Recordation of Trade Name: "CRISSAIR, INC."

Agency: Customs Service, Department of the Treasury
Action: Notice of Application for Recordation of Trade Name
Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CRISSAIR, INC." used by Crissair, Inc., a corporation organized under the laws of the State of California, located at 38905 Tenth St. East, Palmdale, Calif. 93550.

The application states that the trade name is used for the following merchandise manufactured in the United States: hydraulic, fuel, and pneumatic system components (such as valves and actuators) for both military and civilian aircraft and helicopters.

Before final action is taken on the application, consideration will be given to any person in opposition to the recordation of this trade name. Notice of the action taken on the applicaiton for recordation of this trade name will be published in the Federal Register.
Date: Comments must be received on or before Apr. 8, 1985.
Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C., 20229 (202–566–5765).

Jan. 30, 1985.

EDWARD T. ROSSI,
Acting Director, Entry Procedures and Penalties Division.

Department of the Treasury
United States Customs Service

Application for Recordation of Trade Name: "AMERICAN FAN RETAIL ASSOCIATION, INC."

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Application for Recordation of Trade Name
Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "AMERICAN FAN RETAIL ASSOCIATION, INC." used by American Fan Retail Association, Inc., a corporation organized under the laws of the State of Delaware, located at 125 Walnut Ave., Bronx, N.Y. 10454.

The application states that the trade name is used in connection with fans manufactured in Taiwan and Hong Kong.

Before final action is taken on the application, consideration will be given to any person in opposition to the recordation of this trade name. Notice of the action

taken on the application for recordation of this trade name will be published in the Federal Register.
Date: Comments must be received on or before Apr. 12, 1985.
Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

DONALD W. LEWIS,
Jan. 29, 1985. *Director, Entry Procedures and Penalties Division.*

Department of Commerce
Patent and Trademark Office

Interim Protection for Mask Works of Japanese Nationals Domiciliaries and Sovereign Authorities

Agency: Patent and Trademark Office, Commerce
Action: Notice of Initiation of Proceeding
Summary : The Secretary of Commerce has delegated the authority under Section 914 of 17 U.S.C. to make findings and issue orders for interim protection of mask works to the Assistant Secretary and Commissioner of Patents and Trademarks by Amendment 1 to Department Organization Order 10–14. Guidelines for the submission of petitions for the issuance of interim orders were published on Nov. 7, 1984 in the Federal Register, 49 FR 44517–9 and on Nov. 13, 1984 in the *Official Gazette,* 1048 O.G. 30.

On Oct. 22, 1984, prior to the Nov. 8, 1984, effective date of P.L. 98–620 which added Chapter 9 to 17 U.S.C., the Electronic Industries Association of Japan (EIAJ) through its attorneys submitted a request for the issuance of an interim order. That original request has since been supplemented by additional information from the Government of Japan sufficient to bring it into compliance with the aforementioned guidelines. Consequently, in accordance with paragraph F of the guidelines, this notice announces the initiation of a proceeding with respect to Japan for consideration of the issuance of an interim order.

In the interests of time and because of the rapidly approaching July 1, 1985 registration cut-off date for chips first commercially exploited on or after July 1, 1983, a date is being set both for the submission of comments in accordance with paragraph F(a), and a hearing date with respect to paragraph F(b) of the guidelines.
Dates: Comments must be submitted on or before Apr. 22, 1985 and a public hearing will be held May 6, 1985 at 9:30 a.m.; requested to present oral testimony should be received on or before Apr. 22, 1985.
Address: Address written comments to: Commissioner of Patents and Trademarks, Attention Assistant Commissioner for External Affairs, Box 4, Washington, D.C. 20231.

The hearing will be held in the Commissioner's Conference Room, 11th Fl., Crystal Plz. Bldg. 3, Rm. 11-C-10, 2021 Jefferson Davis Hwy., Arlington, Va. Written comments and a transcript of the public hearing will be available for public inspection in Rm. 11C28 Crystal Plz. 3, 2021 Jefferson Davis Hyw., Arlington, Va.
For Further Information Contact: Michael K. Kirk, Assistant Commissioner for External Affairs, by telephone at (703) 557–3065 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: Chapter 9 of 17 U.S.C. establishes an entirely new form of intellectual property protection for mask works that are fixed in semiconductor chip products. Mask works are defined in 17 U.S.C. 901(a)(2) as:

"a series of related images, however, fixed or encoded
(A) having or representing the predetermined, three-dimensional pattern of metallic, insulating or semiconductor material present or removed from the layers of a semiconductor chip product; and
(B) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product."

Chapter 9 further provides for a 10 year term of protection for original mask works measured from their date of registration in the U.S. Copyright Office, or their first commercial exploitation anywhere in the world. Mask works must be registered within 2 years of their first commercial exploitation to maintain this protection. Section 913(d)(1) provides that mask works first commercially exploited on or after July 1, 1983 are eligible for protection provided that they are registered in the U.S. Copyright Office before July 1, 1985.

Foreign mask works are eligible for protection under this Chapter under basic criteria set out in section 902; first, that the owner of the mask works is a national, domiciliary, or sovereign authority of a foreign nation that is a party to a treaty providing for the protection of the mask works to which the United States is also a party, or a stateless person wherever domiciled; second that the mask work is first commercially exploited in the United States; or that the mask work comes within the scope of a Presidential proclamation. Section 902(a)(2) provides that the President may issue such a proclamation upon a finding that:

"a foreign nation extends to mask works of owners who are nationals or domiciliaries of the United States protection (A) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (B) on substantially the same basis as provided under this chapter, the President may by proclamation extend protection under this chapter to mask works (i) of owners who are, on the date on which the mask works are registered under section 908, or the date on which the mask works are first commercially exploited anywhere in the world, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation, or (ii) which are first commercially exploited in that nation."

Although this chapter generally does not provide protection to foreign owners of mask works unless the works are first commercially exploited in the United States, it is contemplated that foreign nationals, domiciliaries and sovereign authorities may obtain full protection if their nation enters into an appropriate treaty or enacts mask works protection legislation. In order to encourage steps toward a regime of international comity in mask works protection, Section 914(a) provides that the Secretary of Commerce may extend the privilege of obtaining interim protection under chapter 9 to nationals, domiciliaries and sovereign authorities of foreign nations if the Secretary finds:

(1) that the foreign nation is making good faith efforts and reasonable progress toward—
(A) entering into a treaty described in section 902(a)(1)(A), or
(B) enacting legislation that would be in compliance with subparagraph (A) or (B) of section 902(a)(2); and
(2) that the nationals, domiciliaries, and sovereign authorities of the foreign nation, and persons controlled by them, are not engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works; and
(3) that issuing the order would promote the purposes of this chapter and international comity with respect to the protection of mask works."

On Oct. 22, 1984, prior to the Nov. 8, 1984 effective date of P.L. 98–620 which added Chapter 9 to 17

U.S.C., the Electronic Industries Association of Japan (EIAJ), through its attorneys, submitted a request for the issuance of an interim order to Secretary Baldrige. The Secretary informed EIAJ's attorneys that the request had been referred to the Patent and Trademark Office, and that the Commissioner would advise them if additional information were required. On Nov. 15, 1984, Commissioner Mossinghoff met with Japanese officials to discuss a letter from Mr. Yuji Tanahashi of the Japanese Ministry of International Trade Industry, and what additional information might be required to complete the EIAJ submission. The results of this meeting were confirmed on Nov. 30, 1984, in a letter to Mr. Tanahashi. No response was received from Mr. Tanahashi. On Jan. 22, 1985, Acting Commissioner Quigg wrote Mr. Taizo Yokayama pointing out what additional information would be required. On Mar. 4, 1985, Mr. Tanahashi wrote to Mr. Quigg to supplement the original request with sufficient information to permit the commencement of proceedings under the guidelines. The original petition and the supplemental information are reproduced below.

In his remarks in the *Congressional Record* of Oct. 10, 1984 at page E4434 Representative Kastenmeier suggests that "[i]n making determinations of good faith efforts and progress . . ., the Secretary should take into account the attitudes and efforts of the foreign nation's private sector, as well as its government. If the private sector encourages and supports action toward chip protection, that progress is much more likely to continue . . . With respect to the participation of foreign nationals and those controlled by them in chip piracy, the Secretary should consider whether any chip designs, not simply those provided full protection under the Act, are subjected to misappropriation. The degree to which a foreign concern that distributes products containing misappropriated chips knows or should have known that it is selling infringing chips is a relevant factor in making a finding under section 914(a)(2). Finally, under section 914(a)(3), the Secretary should bear in mind the role that issuance of the order itself may have in promoting the purposes of this chapter and international comity."

In view of these admonitions, comments are invited on this petition and the supplemental information. Particularly, views are solicited as to the relation of the proposed Japanese legislation and Chapter 9 of 17 U.S.C.; and to the existence or non-existence of any misappropriation of mask works in Japan.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Mar. 22, 1985.

Oct. 22, 1984

Hon. Malcolm Baldrige
Secretary of Commerce
Washington, D. C. 20230

Dear Mr. Secretary:

Enclosed please find a letter and petition from Mr. Akio Morita with respect to Section 914 of the Semiconductor Chip Protection Act of 1984. Mr. Morita's petition is made in his capacity as President of our client, the Electronic Industries Association of Japan.

Please let us know how we may be of the most assistance in answering questions and providing further information in support of the enclosed petition.

Sincerely yours,
Tanaka Walders & Ritger
by Robert S. Schwartz

Oct. 18, 1984

The Honorable Malcolm Baldrige
Secretary of Commerce
Washington D.C. 20230

Re: *Semiconductor Chip Protection Act of 1984*

Dear Mr. Secretary:

Enclosed please find a petition that I have executed today, on behalf of the Electronic Industries Association of Japan. I hope it will meet with your favorable consideration.

Sincerely yours,
Akio Morita
President
Electronic Industries
Association of Japan
Chairman and Chief
Executive Officer
Sony Corp.

Petition of Akio Morita on Behalf of the Electronic Industries Association of Japan Under Section 914(a) of the Semiconductor Chip Protection Act of 1984

WHEREAS Section 914(a) of the Semiconductor Chip Protection Act of 1984 provides that the Secretary of Commerce may issue an order with respect to protection afforded nationals, domiciliaries, and sovereign authorities of any nation of any person, and

WHEREAS the Electronic Industries Association of Japan ("EIAJ") is a business association which includes the major semiconductor manufacturers based in Japan, and the undersigned serves as its President,

The Undersigned, on behalf of the EIAJ, does now petition the Secretary to issue an order respecting Japan, effective as of the date of enactment of the Act and for such time period as the Secretary may decide is reasonable under the circumstances. It is further petitioned that said order be issued expeditiously in the case of Japan, in conformance with the statutory criteria and legislative history pertaining to the Act.

In support of the expeditious issuance of an order with respect to Japan, effective as of the date of enactment, reference is made to the following facts:

1. The private semiconductor industry in Japan, as represented by EIAJ, during the pendency of the Act advised the U.S. Congress by official letter (Appendix I hereto) of its support for the Act and its support for expeditious legislation in Japan.
2. The Government of Japan, through the joint recommendations of the United States-Japan Work Group on High Technology Industries, has agreed to a bilateral declaration in support of such legislation. in this regard, the Industrial Structure Council, an advisory committee to the Minister of International Trade and Industry, has organized a formal study group, the Subcommittee on Legislative Problems Concerning Semiconductor Chips, to draft appropriate legislation. The first meeting of the Subcommittee has been scheduled for Oct. 24, 1984.
3. Japan has a substantial semiconductor industry. In light of the above considerations with respect to progress toward legislation in Japan, expedited issuance of an order is appropriate to encourage and facilitate efforts to establish international comity.
4. Insofar as can be determined, Japan's commercial entities are not engaging in, and have not in the recent past engaged in, the activities described in Section 914(a)(2) of the Act.

WHEREFORE, on behalf of the EIAJ I do petition that an order, as described, issue expeditiously with respect to Japan.

Respectfully submitted,
Akio Morita
Oct. 18, 1984. President
Electronic Industries
Association of Japan
Chairman and Chief
Executive Officer
Sony Corp.

Thank you for any consideration you can give to the approach we suggest. As always, my personal best wishes,

Sincerely yours,
Akio Morita
President
Electronic Industries
Association of Japan
Chairman & Chief
Executive Officer
Sony Corp.

Appendix I

July 18, 1984

Hon. Robert W Kastenmeier
Chairman
Subcommittee on Courts, Civil Liberties and the Administration of Justice
Judiciary Committee
U.S. House of Representatives
Washington, D.C. 20515
U.S.A.

Dear Rep. Kastenmeier:

The Electronic Industries Association of Japan (EIAJ) has been following the progress, through the Congress, of legislation that would afford a new form of protection for semiconductor chip products. In our view, the passage of such legislation is highly desirable, both of itself and as an indication of the proper direction for the international protection of such intellectual property. In this latter respect, we note the joint recommendations of the U.S.-Japan Work Group on High Technology Industries, made in Nov. 1983. One such recommendation of this government-to-government group was:

III. Technology

3. Both governments should recognize that some form of protection to semiconductor producers for their intellectual property is desirable to provide the necessary incentives for them to develop new semiconductor products. And both governments should take their own appropriate steps to discourage the unfair copying of semiconductor products and the manufacturing and distribution of the unfairly copied semiconductor products.

Since the U.S. legislation will be the first of its kind in the world, we hope that it will meet the challenge posed by the development of a new class of intellectual property by affording it a commensurately new form of protection. We expect that this approach by the U.S. will serve as a model for other countries. In this respect we feel it would be very beneficial for such legislation to maintain an incentive for foreign nations to "catch up", without departing from the principle of full national treatment. This could be accomplished by a reasonable interim period for full-term registration, not limited by considerations of nationality, domicile, or place of first commercial exploitation. This suggestion was spelled out in a July 9 letter from our Washington counsel (which is attached). We have also suggested, through counsel, some important technical clarifications of interpretation. I would be gateful if you could consider our suggestions in any conference proceedings.

In this connection, we have been asked whether EIAJ has a view as to probable or appropriate legislative action in Japan. Speaking on behalf of the semiconductor manufacturers of Japan, EIAJ recognizes the need for, and importance of, protection in Japan for the intellectual property embodied in semiconductor chips. Accordingly, we will ask the Government of Japan to provide such protection, as expeditiously as possible, through a new legislative framework.

July 18, 1984

Hon. Charles McC. Mathias
Chairman
Subcommittee on Patents,
Copyrights and Trademarks
Judiciary Committee
U.S. Senate
Washington, D.C. 20510
U.S.A.

Dear Sen. Mathias:

I was sorry to have missed the opportunity to see you during my recent trip to Washington. I do hope, however, that we will have another chance before too long. In the meantime, I did want to call to your attention something that is of great interest in my capacity as President of the Electronic Industries Association of Japan (EIAJ).

EIAJ has been following the progress, through the Congress, of legislation that would afford a new form of protection for semiconductor chip products. In our view, the passage of such legislation is highly desirable, both of itself and as an indication of the proper direction for the international protection of such intellectual property. In this latter respect, we note the joint recommendations of the U.S.-Japan Work Group on High Technology Industries, made in November, 1983. One such recommendation of this government-to-government group was:

III. Technology

3. Both governments should recognize that some form of protection to semiconductor producers for their intellectual property is desirable to provide the necessary incentives for them to develop new semiconductor products. And both governments should take their own appropriate steps to discourage the unfair copying of semiconductor products and the manufacturing and distribution of the unfairly copied semiconductor products.

Since the U.S. legislation will be the first of its kind in the world, we hope that it will meet the challenge posed by the development of a new class of intellectual property by affording it a commensurately new form of protection. We expect that this approach by the U.S. will serve as a model for other countries. In this respect we feel it would be very beneficial for such legislation to maintain an incentive for foreign nations to "catch up", without departing from the principle of full national treatment. This could be accomplished by a reasonable interim period for full-term registration, not limited by considerations of nationality, domicile, or place of first commercial exploitation. This suggestion was spelled out in a July 9 letter from our Washington counsel (which is attached). We have also suggested, through counsel, some important technical clarifications of interpretation. I would be grateful if you could consider our suggestions in any conference proceedings.

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Thank you for any consideration you can give to the approach we suggest. As always, my personal best wishes,

Sincerely yours,
Akio Morita
President
Electronic Industries
Association of Japan
Chairman and Chief
Executive Officer
Sony Corp.

Mar. 4, 1985

Mr. Donald J. Quigg
Acting Commissioner of Patents
and Trademarks

Dear Mr. Quigg:

I would like to relate the following to you in connection with the efforts we have made and the progress we have achieved in legislative initiatives for the protection of semiconductor chips in Japan since I wrote to Mr. Mossinghoff on Nov. 13, 1984.

On Jan. 22, 1985, the Subcommittee on the Legal Problems Concerning Semiconductor Chips under the Industrial Structure Council, after seven sessions since Oct., 1984 reached a conclusion that, in sum, a new law similar to the Semiconductor Chip Protection Act of the United States is necessary for optimal protection of the layout of semiconductor chips in Japan, and recommended that the Ministry of International Trade and Industry ("MITI") start preparation for enactment of such a law as soon as possible. I believe you have received an English text of the report of the Subcommittee, since we turned it in to the United States Embassy in Japan.

Mr. Akio Morita, President of the Electronics Industry Association of Japan ("EIAJ"), also requested that the Minister of International Trade and Industry promptly enact a new law similar to that of the United States.

Under these circumstances, MITI, as a governmental agency in charge of developing legislation for the protection of mask works, is making an energetic effort to submit a legislative bill to the present session of the Diet. We are drafting the bill with due consideration for the views expressed on the outline of the bill by the semiconductor industry, including foreign affiliates. Although there is no fundamental objection to this effort among governmental agencies, the decision of the Japanese government as a whole to submit the bill will be made most probably in the middle of March since adjustments are necessary within the government pursuant to the ordinary legislative procedure.

Meanwhile, MITI has good grounds for believing that neither Japan nor Japanese nationals or domiciliaries are engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works. As you are aware, MITI has taken action to make people and industries concerned throughly understand the view expressed in the recommendation of the Japan-U.S. High Tech Work Group—"Both governments should take their own appropriate steps to discourage the unfair copying of semiconductor products and the manufacturing and distribution of unfairly copied semiconductor products.", and I believe the Japanese semiconductor industry has been responding sincerely to this action.

A petition under Section 914 of the Semiconductor Chip Protection Act of 1984 (17 U.S.C.) was filed with the Secretary of Commerce by Mr. Akio Morita of EIAJ. Considering the circumstances mentioned above, I believe conditions for issuance of an order under 17 U.S.C. Section 914(a)(1)(B) are fully satisfied.

Yours sincerely,
Yuji Tanahashi
Deputy Director-General
Machinery and Information
Industries Bureau Ministry of
International Trade and
Industry

Semiconductor Integrated Circuit Protection Bill of Japan (Summary)

Feb., 1985

1. Definitions

(1) A "semiconductor integrated circuit product" means any product having transistors and other elements which are inseparably formed on the surface of a semiconductor or insulating material, or inside the semiconductor material, and intended to perform circuitry functions.

(2) A "circuit layout" means a three-dimensional layout of elements and wires in a semiconductor integrated circuit product.

(3) "Utilize" means manufacture, transfer, lease, exhibition or import of semiconductor integrated circuit products embodying a circuit layout.

2. The following rights can be claimed:

(1) The holder of a circuit layout right shall have an exclusive right to utilize, for business purposes, the circuit layout.

(2) The holder of a circuit layout right or an exclusive licensee may seek an injunction against a person who infringes or likely to infringe on the circuit layout right or exclusive license.

(3) The manufacture, transfer, etc., for business purposes, of articles, such as masks, to be used exclusively for the manufacture of the infringing semiconductor integrated circuit products shall be deemed to be an infringement of the circuit layout right.

(4) The infringing party shall be liable for damages for infringement and shall be subject to criminal punishment.

3. Registration system

(1) A person who has originally developed the circuit layout, or his successor, may apply for registration for the establishment of a circuit layout right within two years of the date on which he first transferred, leased or exhibited the concerned semiconductor integrated circuit products for business purposes.

(2) The circuit layout right shall come into force upon registration for its establishment. (The registration system shall be a simple one.)

4. Term of protection

The term of protection shall be ten years from the date on which the right was created.

5. Limitation of exclusive rights

(1) The experimental manufacturing for the purpose of analyzing or evaluating the circuit layout, electronic circuitry or logic circuitry of a semiconductor integrated

circuit product embodying a circuit layout right shall not constitute an infringement.

(2) Utilizing an originally developed circuit layout based upon electronic circuitry or logic circuitry analyzed and evaluated as described in paragraph (1) shall not constitute an infringement.

(3) When the holder of a right to a semiconductor integrated circuit product transfers it to another, the transferee thereof may transfer, lease, exhibit or import the product without the authority of the holder of the right ("first sale doctrine").

(4) A bona fide purchaser, without (gross) negligence, of an infringing semiconductor integrated circuit product who has transferred it to another after learning of the infringement shall be held responsible for the payment of a fair price to the legitimate holder of the right but shall not be subject to injunction or damages.

6. Protection of a circuit layout developed by a foreigner Under consideration.

(The law shall extend protection without discrimination to a circuit layout developed by a national or a domiciliary of a foreign country at least if a circuit layout developed by a Japanese national or a domiciliary of Japan is protected by that country.)

7. Other provisions

Other provisions to be established include provisions concerning exclusive and non-exclusive licenses and a provision to the effect that if an employee of a company develops a circuit layout, the right concerning the layout shall, unless otherwise agreed, belong to the company.

Nov. 13, 1984

Mr. Gerald J. Mossinghoff
Commissioner of Patents and Trademarks Office
Department of Commerce

Dear Mr. Mossinghoff:

As co-chairman of the Japan-U.S. High Tech Work Group I would like to relate the following to you in connection with the materialization of your country's Semiconductor Chip Protection Act of 1984.

At the Sept. 14th meeting of the High Tech Work Group it was requested of me that, in consideration of the enactment of the Semiconductor Chip Protection Act in the United States, Japan enact legislation to the same effect. I myself have agreed with the High Tech Work Group's recommendation made in Nov. 1983 as to the need for Japanese legislation to protect developers of semiconductor chips, and I am now pleased to let you know that serious consideration of this issue has begun with the abovementioned request taken into account.

A subcommittee on legislative issues concerning semiconductor chips has been set up within the Industrial Structure Council and was convened for the first time on Oct. 24th. I would like to add that participating in the subcommittee are Japanese representatives of Intel Japan K.K. (a U.S. affiliate) and Texas Instruments Japan Ltd. (a U.S. affiliate). Because the authority to enact laws rests with Japan's legislative body, the Diet, and because of differences between our legal system and that of the United States, I am not able to state anything definitive as yet. But I do want to consolidate the views of those of us within the Government and lay a bill before the Diet at the earliest possible date.

In addition to more effectively protecting rights relating to semiconductor chips in line with the High Tech Work Group's recommendation, on a fundamental level we are interested in making efforts towards drafting a proposed law similar to that enacted by your country.

Finally, I am sure we agree that close cooperation between our two Governments is essential to the sound growth of the semiconductor chip industry and also of trade in this item. Let us, then, cooperate closely in the future application of the Semiconductor Chip Protection Act and in the enactment of a new law in Japan.

Yours sincerely,
Yuji Tanahashi
Chairman of the Japan-U.S.
Work Group on High
Technology Industries
Deputy Director-General,
Machinery and Information
Industries Bureau Ministry of
International Trade and
Industry

P.S. In connection with the above, I would like to add that I have been informed that Mr. Morita, representing the views of the Japanese semiconductor industry, has presented a petition to the Secretary of Commerce in accordance with Article 914 of the U.S. Semiconductor Chip Protection Act.

Nov. 30, 1984

Mr. Yuji Tanahashi
Chairman of the Japan-U.S. Work Group
on High Technology Industries
Deputy Director-General
Machinery and Information
Industries Bureau
Ministry of International
Trade and Industry
1-3-1 Kasumigaseki
Chiyoda-ku
Tokyo 100 Japan

Dear Mr. Tanahashi:

Thank you for your earlier inquiry concerning the extension of interim protection to Japanese mask works under Section 914 of the Semiconductor Chip Protection Act of 1984. On Nov. 15, 1984, I met with Mr. Taizo Yokoyama and Mr. Nobuo Tanaka of the Japanese Embassy here in Washington to discuss a number of matters related to chip protection. I would like to assure you, as I assured them, that any Japanese request for the issuance of an order extending interim protection will be given serious and prompt consideration. However, there are certain factors that must be considered in arriving at a determination to issue or not to issue such an order.

Although requests for the issuance of an order may be submitted by any party, Section 914 requires that the Secretary of Commerce make certain findings with respect to the activities of foreign governments and sovereign authorities as well as organizations controlled by them. Section 914(a)(1) requires that the Secretary must find that the foreign nation is making good faith efforts and reasonable progress toward entering into a treaty or enacting appropriate legislation. This finding must be made with respect to the government involved. As I informed Mr. Yokoyama and Mr. Tanaka, we will require a statement attesting to good faith efforts and reasonable progress from an agency which can speak for your Government, especially in view of the potential dispute between your Ministry and the Ministry of Education over jurisdiction for the preparation of semiconductor chip legislation. In view of the differences in our legislative processes, such a statement should include as much information as is available on the nature of the protection under consideration and the processes to be followed in its implementation into law.

I agree that close cooperation between our two nations, which are leaders in the development of this new technology, is important. I hope that we can work together in a way that will promote international comity in mask work protection.

Sincerely,
Gerald J. Mossinghoff
Commissioner of Patents
and Trademarks

Jan. 22, 1985

Mr. Tazio Yokoyama
Embassy of Japan
2520 Massachusetts Ave., N.W.
Washington, D.C. 20008

Dear Mr. Yokoyama:

I am writing to follow up on an earlier conversation that you had with Commissioner Gerald J. Mossinghoff on Nov. 15, 1984, concerning the protection of Japanese mask works. As you may recall, Mr. Mossinghoff assured you that any Japanese request for the issuance of an interim order under section 914 of the Semiconductor Chip Protection Act of 1984 would receive prompt and serious consideration.

At that meeting, Mr. Mossinghoff advised you that before we could consider further Japan's request we would require additional information regarding the efforts and progress toward enacting chip legislation in Japan, and that this information should be provided by an agency that could speak for the Japanese Government. You also informed Mr. Mossinghoff that he would receive a letter from MITI Deputy Director General Tanahashi attesting to MITI's efforts. On Nov. 30, 1984, we responded to Mr. Tanahashi's letter and advised him of our need for further information in view of the potential jurisdictional dispute between MITI and the Ministry of Education. To date, we have not received the information that we requested.

In view of the July 1, 1985 deadline for registration of chips first commercially exploited after July 1, 1983, time is of the essence. We are anxious to obtain the needed assurances from the Government of Japan that you are progressing on legislation that would protect the mask works of U.S. nationals in a fashion similar to the protection provided under the new U.S. law.

I hope that we will soon receive the statements that will permit us to initiate proceedings with respect to Japan's eligibility for protection under the U.S. legislation.

Sincerely,
Donald J. Quigg
Acting Commissioner of
Patents and Trademarks

PATENT NOTICES

Certificates of Correction for the Week of Apr. 23, 1985

Pp. 4,121	4,445,895	4,469,688	4,481,644
D. 269,223	4,446,461	4,470,068	4,481,764
D. 276,128	4,447,350	4,470,964	4,482,268
D. 276,274	4,448,192	4,470,994	4,482,379
D. 276,753	4,449,200	4,471,088	4,482,444
3,883,545	4,450,242	4,471,384	4,482,571
4,189,478	4,450,470	4,471,745	4,483,184
4,273,612	4,451,422	4,471,800	4,483,372
4,297,879	4,451,996	4,471,992	4,483,493
4,311,666	4,453,256	4,472,027	4,483,598
4,328,667	4,454,361	4,472,479	4,484,109
4,329,293	4,455,361	4,473,388	4,484,255
4,344,976	4,455,747	4,473,642	4,484,314
4,360,098	4,456,684	4,473,912	4,484,546
4,364,419	4,457,390	4,474,140	4,484,568
4,371,883	4,457,542	4,474,372	4,484,698
4,380,684	4,458,695	4,474,909	4,484,785
4,388,386	4,461,178	4,474,910	4,484,918
4,389,510	4,461,388	4,474,916	4,485,209
4,394,296	4,462,211	4,475,004	4,485,285
4,396,235	4,462,877	4,475,414	4,485,352
4,406,801	4,463,182	4,475,947	4,485,359
4,409,344	4,463,220	4,476,044	4,485,530
4,410,518	4,463,427	4,476,372	4,485,674
4,411,993	4,463,782	4,476,416	4,485,908
4,416,132	4,464,446	4,478,509	4,485,966
4, 416,994	4,464,466	4,478,561	4,486,101
4,421,287	4,464,755	4,478,603	4,487,026
4,422,147	4,464,966	4,478,656	4,487,392
4,422,158	4,467,195	4,478,891	4,488,395
4,423,360	4,467,258	4,479,273	4,489,431
4,427,761	4,467,355	4,479,335	4,489,847
4,430,906	4,467,440	4,479,754	4,490,160
4,431,411	4,467,454	4,479,929	4,490,396
4,431,449	4,467,969	4,480,267	4,490,523
4,432,925	4,468,171	4,480,487	4,490,559
4,434,429	4,468,223	4,480,515	4,491,151
4,436,221	4,468,235	4,480,897	4,491,152
4,438,020	4,468,527	4,481,167	4,491,180
4,438,146	4,468,956	4,481,234	4,491,257
4,438,258	4,468,971	4,481,320	4,491,275
4,438,387	4,468,983	4,481,512	4,491,319
4,441,353	4,469,243	4,481,528	4,491,638
4,444,937	4,469,350	4,481,574	

Disclaimers

Re. 31,528.—*David F. Mieyal,* Strongsville, Ohio. GRID TEE FOR SUSPENSION CEILINGS OR THE LIKE. Patent dated Mar. 6, 1984. Disclaimer filed May 7, 1984, by the assignee, *Donn, Inc.*

Hereby enters this disclaimer to claim 38 of said patent.

4,370,008.—*Richard G. Haworth,* Holland; *Charles J. Saylor,* Zeeland and *Harold R. Wilson,* Holland, Mich. WALL PANEL WITH PREWIRED POWER SYSTEM. Patent dated Jan. 25, 1983. Disclaimer filed Feb. 27, 1985, by the assignee, *Haworth, Inc.*

The term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

4,485,031.—*Franciszek Olstowski,* Freeport and *Richard D. Peffley,* Lake Jackson, Tex. COMPATIBLE MIXTURES OF AMINATED POLYETHER POLYOLS AND LOW MOLECULAR WEIGHT GLYCOLS. Patent dated Nov. 27, 1984. Disclaimer filed Dec. 10, 1984, by the assignee, *Dow Chemical Co.*

The term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

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The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4277
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 2, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-20-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	8-10-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-30-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-20-81
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-20-82
DESIGN, GROUP 290—K. L. CAGE, Director	11-08-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-28-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-22-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-30-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-25-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-21-83

Expiration of patents: The patents within the range of numbers indicated below expire during March 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,371,351 to 3,375,528, inclusive

Plant Patents ..... Numbers 2,797 to 2,801 inclusive

REISSUES

APRIL 23, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,869

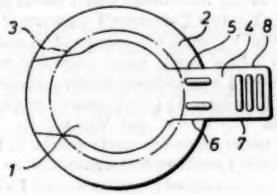
BOTTLE CAPS

Sune Harding, Partille, Sweden, assignor to AB Wicanders Korkfabriker, Alvangen, Sweden

Original No. 3,963,140, dated Jun. 15, 1976, Ser. No. 536,719, Dec. 27, 1974. Application for reissue Aug. 16, 1977, Ser. No. 825,190

Int. Cl.[3] **B65D** *41/42*

U.S. Cl. 215—254 **9 Claims**



7. A tear-off convenience bottle cap comprising a circular top panel surrounded by a cylindrical skirt terminating in a lowermost free edge, a radiused juncture portion connecting said top panel and said skirt, a gripping ear formed as an integral part of said skirt extending downwardly and radially outwardly from said free edge, a tearing zone commencing at said skirt free edge on either side of said gripping ear and extending upwardly across said skirt, each of said tearing zones blending in an outwardly diverging pattern into a path lying in close proximity to the periphery of said cap top panel, said tearing zones extending rearwardly from said gripping ear so as to partially surround said cap top panel and an annular sealing gasket adhesively affixed to said cap interior so as to completely overlie said tearing zones along said path whereby removal of said cap causes tearing of said gasket along said path.

Re. 31,870

MEANS FOR YIELDABLY COUPLING A SHAFT TO COUNTER WHEELS OR THE LIKE

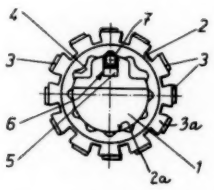
Friedemann Wagner, Furtwangen, Fed. Rep. of Germany, assignor to Ernst Reiner, KG Feinmechanik und Apparatebau, Furtwangen, Fed. Rep. of Germany

Original No. 4,299,512, dated Nov. 10, 1981, Ser. No. 91,398, Nov. 6, 1979. Application for reissue Jun. 29, 1982, Ser. No. 393,376

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1978, 2848039

Int. Cl.[3] **B41J** *1/60;* **B25G** *3/28*

U.S. Cl. 101—110 **33 Claims**



20. In a printer, a plurality of axially aligned wheels, each having a plurality of different printing elements coupled thereto, a support for rotatably supporting said wheels, said wheels having holes defining a continuous opening, each of said wheels also having a series of recesses, detenting means including a metal helical spring engaging a plurality of said wheels for detenting the wheels, said detenting means including means providing a recess in said support, said recess in said support having an open side, said helical spring being disposed in said recess in said support and projecting beyond the open side into one recess in each wheel to detent the wheels and align selected printing elements at a printing zone.

Re. 31,871

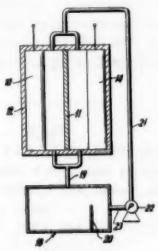
METAL HALOGEN BATTERIES AND METHOD OF OPERATING SAME

Agustin F. Venero, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Original No. 4,105,829, dated Aug. 8, 1978, Ser. No. 674,583, Apr. 7, 1976. Application for reissue Dec. 17, 1979, Ser. No. 104,336

Int. Cl.[3] **H01M** *8/08, 4/60*

U.S. Cl. 429—15 **22 Claims**



1. An electrochemical cell having a metal bromine couple comprising:

an electrode structure on which to deposit the metal of the metal bromine couple;

an inert counterelectrode structure at which to generate the bromine of the metal couple;

an aqueous electrolyte containing a metal bromide and a bromine complexing agent, the metal of said metal bromide being selected from zinc and cadmium, said bromine complexing agent being selected from water soluble organic quaternary ammonium compounds and mixtures of quaternary ammonium compounds with water soluble organic solvents which in the presence of bromine and at temperatures in the range of about 10° C. to about 60° C. form a substantially water immiscible liquid;

means for circulating said electrolyte between said electrode structures during charging of the cell;

a separation zone communicating with said cell whereby bromine complex formed during charging of the cell is separated from said aqueous electrolyte; and,

means for circulating separated bromine complex from said separation zone to said cell during discharge of said cell.

Re. 31,872

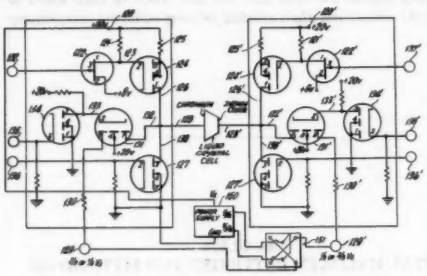
ELECTRO-OPTICAL DISPLAY WITH CIRCUITRY FOR APPLYING PREDETERMINED POTENTIALS TO ALL DISPLAY SEGMENTS TO EFFECT ACTIVATION OF A SELECTED SEGMENT ONLY

Sam G. Cohen, Pleasantville, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Original No. 3,932,860, dated Jan. 13, 1976, Ser. No. 463,927, Apr. 25, 1974. Application for reissue Jul. 8, 1982, Ser. No. 396,224

Int. Cl.³ G09G 3/36; G06F 3/14

U.S. Cl. 340—784 11 Claims



1. An electro-optical display *for a timepiece* comprising:

a first and a second plate each having on one side thereof a pattern formed by segments, said segments being layers of conductive material, [at least some of said segments being electrically connected together;] *said second plate segment pattern comprising a plurality of radial segments and said first plate segment pattern comprising a plurality of common segments, each common segment being aligned with a predetermined number of said radial segments, each radial segment, aligned with one common segment, being electrically connected to only one radial segment from said number of radial segments aligned with another common segment,* said plates being spaced from each other and with the segments on each plate aligned; a thin layer of liquid crystal material sandwiched between said plates, said liquid crystal material characterized by a threshold voltage of V_t;

a driver circuit connected to said segments and a voltage source of V_s connected to said driver circuit, said driver circuit having first voltage supply means *adapted* to provide [a] *to* first [selectable] segments of the first plate to voltage V_1 which is a fraction of V_s and less than V_2, second voltage supply means *adapted* to provide to first [selectable] *predetermined* segments of said second plate [with] a voltage V_2 greater than V_1 and a fraction of V_s wherein $V_1+V_2=V_s$ and $V_2>V_t>V_1$, third voltage supply means *adapted* to supply voltage V_s [.] to second [selectable] *predetermined* segments of the first plate and fourth means *adapted* to switch second [selectable] *predetermined* segments of the second plate to zero voltage, whereby the liquid crystal material between the first segments is not activated and the liquid crystal material between the second segments is activated.

PLANT PATENTS

GRANTED APRIL 23, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,442
AVOCADO TREE-SCHILLER

Pinchas Barkan, Kvutsat Schiller, Israel, assignor to Kvutsat Schiller Kvutsat Ovdim Lehityashvut Shitufit Ltd., Kvutsat Schiller, Israel

Filed Jul. 1, 1983, Ser. No. 510,751
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—44 **1 Claim**

1. The new variety of avocado tree of the Mexican group substantially as described and illustrated herein, being distinguished for its ability to produce mature fruit having light green skin and to bring this fruit to maturity about two weeks earlier than the fruit of comparable early maturing avocado varieties in the same growing area.

5,443
KALANCHOE PLANT NAMED SONORA

Peter S. Hesse, Bradenton, Fla., and Margaret M. Fleming, Half Moon Bay, Calif., assignors to Pan American Plant Company, Parrish, Fla.

Filed Jul. 1, 1983, Ser. No. 510,409
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive Kalanchoe plant named Sonora, as described and illustrated, and particularly characterized by rose colored flowers, compact habit, highly floriferous habit, free branching, average 15-week flowering response, and its adaptability to production in 10–15 cm. pots.

5,444
CARNATION NAMED LONFOREM

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,514
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinctive spray carnation cultivar, substantially as herein shown and described, characterized by the Indian Yellow and Scarlet coloration of its small blooms which are produced profusely on strong, straight peduncles carried on tall, upright and strong flowering stems; and by its vigorous and upright growth habit, rather abundant foliage and resistance to *Fusarium oxysporum.*

5,445
CARNATION NAMED LONDELIEN

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,564
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct spray carnation variety, substantially as herein shown and described, characterized by the very strong Brick Red and Magenta Rose coloring of its small blooms which are produced profusely on tall, straight and strong flowering stems, and by its vigorous and upright growth habit, abundant foliage and resistance to *Fusarium oxysporum.*

5,446
CARNATION NAMED LONSICO

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,521
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A new carnation cultivar, substantially as herein shown and described, characterized by its ruby red flowers of medium size which bloom profusely during each of its recurrent blooming seasons, and by its vigorous growth habit which is resistant to *Fusarium oxysporum.*

5,447
CHRYSANTHEMUM PLANT NAMED REMARKABLE

William E. Duffett, Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Jul. 15, 1983, Ser. No. 514,319
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—82 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Remarkable, as described and illustrated, and identified by the combined charcteristics of flat capitulum form, decorative capitulum type, orange-red ray floret color, diameter across face of capitulum up to 50 mm., short plant height, semi-spreading branching pattern, average natural season flowering date of September 20 and average flowering response period of seven weeks in photoperiodic controlled short day programs.

PATENTS

GRANTED APR. 23, 1985

ERRATA

For CLASS	See PATENT NO.
354–475	4,512,656
446–061	4,512,690
514–147	4,512,984
514–301	4,512,985
514–170	4,512,986
514–171	4,512,987
514–211	4,512,988
514–383	4,512,989
514–225	4,512,990
514–252	4,512,991
514–258	4,512,992
514–275	4,512,993
514–374	4,512,994
514–277	4,512,995
514–304	4,512,996
514–383	4,512,997
514–367	4,512,998
514–192	4,512,999
514–407	4,513,000
514–394	4,513,001
514–408	4,513,002
514–411	4,513,003
514–414	4,513,004
514–451	4,513,005
514–023	4,513,006
514–555	4,513,007
514–560	4,513,008
514–513	4,513,009
514–651	4,513,010
514–730	4,513,011
455–052	4,513,443

PATENTS

GRANTED APRIL 23, 1985

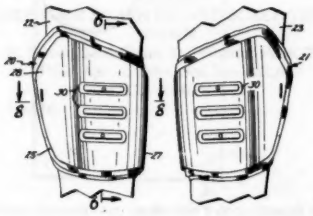
GENERAL AND MECHANICAL

4,512,037

PROTECTIVE PAD ASSEMBLY

Eugene J. Vacanti, Edina, Minn., assignor to Sports Marketing, Inc., Minneapolis, Minn.

Filed Aug. 17, 1982, Ser. No. 409,014
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **14 Claims**



1. A protective pad assembly for protection of a thigh of a persons body from injury, comprising:

a shield of relatively rigid material having a transverse curved shape generally in conformance with and somewhat larger than the thigh of a persons body to be protected; said shield having an outside portion locatable adjacent the outside of a thigh, an inside portion locatable adjacent the inside of the thigh, and an outer edge surrounding the shield; a cushion having an outer periphery shaped to conform to the interior surface of the shield and positioned to contact the thigh to be protected; said cushion having an outer perimeter projected outwardly from the outer edge of the shield, said cushion comprising a pad of springy compressible air entrained open cellular material of the type that expels air upon compression, and returns air into the cellular material upon expansion thereof, air impervious flexible sheet means having a chamber accommodating the pad, said pad substantially filling the chamber, said sheet means having an outer portion at the outer perimeter of the cushion, said sheet means holding the entire pad under less than complete compression thereof, and a plurality of openings in the outer portion of the sheet means for regulating air flow through the sheet means and out of the pad upon further compression of the pad from impact of an external force on the shield and through the sheet means and into the pad upon expansion of the pad, and

means releasably connecting the cushion to the interior surface of the shield, said means having first members secured to the interior surface of the shield and second members secured to the sheet means, said first and second members having releasable cooperating means.

4,512,038

BIO-ABSORBABLE COMPOSITE TISSUE SCAFFOLD

Harold Alexander, Short Hills; John R. Parsons, Montclair; Irving D. Strauchler, Irvington, and Andrew B. Weiss, Short Hills, all of N.J., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Division of Ser. No. 033,945, Apr. 27, 1979, Pat. No. 4,329,743.
This application Apr. 6, 1981, Ser. No. 251,285
Int. Cl.³ A61F *1/00*
U.S. Cl. 3—1.9 **18 Claims**

1. A bio-compatible composition comprising a composite of a plurality of stacked substrates, each substrate comprising a plurality of carbon fibers completely enveloped by a bio-absorbable and bio-compatible polylactic acid polymer, wherein the weight ratio of carbon fibers to bio-absorbable and bio-compatible polymer is such that the said composite has sufficient strength and rigidity to form a surgical article therefrom especially adapted for the stabilization and repair or replacement of fractured bone tissue such that the rate of loss

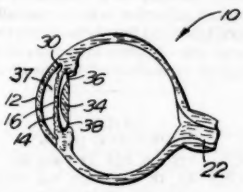
of the strength and rigidity of the composite due to absorption of the bio-absorbable polymer by the tissue substantially coincides with the rate of new bone tissue growth thereby enabling a gradual transference of load from the composite to new tissue in a human or non-human animal.

4,512,039

METHOD OF OFFSETTING POSTOPERATIVE ASTIGMATISM WITH AN INTRAOCULAR LENS

David M. Lieberman, 9 Prospect Park West, Brooklyn, N.Y. 11215

Filed May 24, 1983, Ser. No. 497,504
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **3 Claims**



1. A method for offsetting postoperative astigmatism induced by a surgeon as a result of cataract surgery, wherein the surgeon has estimated the induced astigmatism based on previous cataract surgery performed by said surgeon, said method comprising the steps of:

making an incision at the upper part of the juncture between the cornea and the sclera;

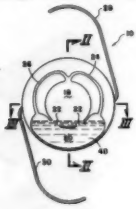
removing the cataract lens;

providing a toric lens having two transverse meridians of unequal power, with the difference in power being sufficient to offset the astigmatism anticipated to be induced by the surgery;

inserting the lens in the eye such that the weaker power meridian is vertically aligned; and

suturing the incision in the eye, whereby the toric lens offsets the astigmatism induced by the surgery.

4,512,040
BIFOCAL INTRAOCULAR LENS
Hubert L. McClure, 7777 S. Harvard Pl., Tulsa, Okla. 74136
Filed Jun. 9, 1982, Ser. No. 502,695
Int. Cl.[3] A61F *1/16, 1/24*
U.S. Cl. 3—13 **3 Claims**



1. An intraocular lens for implantation into a human eye comprising:

(a) an optical lens suitable for replacing a human crystalline lens wherein said optical lens consists of an inner transparent wall and an outer transparent wall which define an internal closed space within said lens wherein said internal closed space comprises:

(i) a refractive chamber centrally located in said lens such that it is in the line of sight when said lens is implanted into an eye;

(ii) a reservoir chamber in direct fluid communication with said refractive chamber and located in said lens such that it is in vertical alignment with said refractive chamber when said lens is implanted into an eye but not in the line of sight; and

(iii) at least one vent tube means within said lens and not in the line of sight wherein said vent tube means establishes fluid communication between said reservoir chamber and the far edge of said refractive chamber remote to said reservoir chamber;

(b) an eye attachment means operatively connected to said optical lens and adapted to fasten and retain said optical lens when implanted into the eye; and

(c) a sufficient quantity of a transparent liquid means of predetermined refractive index to partially fill said internally closed space and flow between said refractive chamber and reservoir chamber, in and out of the line of sight, as the angle of inclination of the line of sight changes.

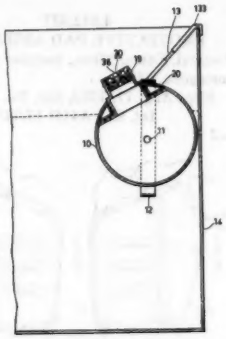
4,512,041
DISPENSING DEVICE
Tseng B. Tsai, No. 118, La. 526, Ta-Tung Rd., Tainan, Taiwan
Filed Oct. 18, 1983, Ser. No. 543,010
Int. Cl.[3] E03D *9/02*
U.S. Cl. 4—227 **2 Claims**

1. A device for dispensing liquid cleanser into a toilet tank, comprising:

a container including a first chamber having a through bore and a second chamber associated with said first chamber yet not communicated therewith for storing liquid to be dispensed, said second chamber formed with an upstanding fill tube portion extending through said bore of said first chamber;

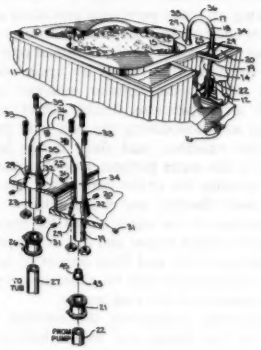
a dispensing member provided in said fill tube portion, which member has a tortuous passage ending in an outlet orifice, by which a quantity of liquid defined by the dimensions of said tortuous passage will dispense from said orifice into the toilet tank;

an adjustable mounting means, detachably mounted to said toilet tank and privotably connected to said second chamber at two ends thereof such that when the tank is full said container will be held in the tank water in a normal position with the upper end of said fill tube disposed above the highest flush water level within said toilet tank and when the tank water level recedes during flushing said first chamber and said second chamber will pivot with respect



to said mounting as a unit about said pivotal connection to dispense a predetermined quantity of liquid defined by the dimensions of said tortuous passage.

4,512,042
RAILING FOR SPA OR THE LIKE
William H. Striegel, Howards Grove, and Willard H. Schmitz, Plymouth, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed May 16, 1983, Ser. No. 494,947
Int. Cl.[3] E04H *3/16, 3/18, 3/19*
U.S. Cl. 4—496 **1 Claim**



1. A railing for a spa or the like, comprising:

a tubular railing having an upwardly extending portion leading from an inlet, a downwardly extending portion leading to an outlet, and a cross portion connecting the upper ends of the upwardly and downwardly extending portions;

at least a grip section of said railing comprising an outer decorative tube and a flexible inner insulating tube;

said insulating tube having been formed separately from the outer decorative tube and then having been positioned therein so as to permit the passage of air through the insulating tube, from its inlet end to its outlet end;

a cover ring which bears axially against and covers the junction of the insulating tube and the outer decorative tube in the direction of air flow to restrict the entry of air therebetween; and

a guide sleeve extending from said cover ring and inserted in

the inlet end of the insulating tube to guide air into the insulating tube;

whereby the sleeve limits the inward movement of the inlet end of the flexible insulating tube away from the outer tube, and covers a radially inward junction between the cover ring and insulating tube.

4,512,043

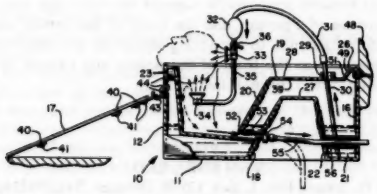
PORTABLE HAIR SHAMPOO AND SCALP TREATMENT BASIN

William D. Nolan, 3105 Grant St., Wichita Falls, Tex. 76308

Filed Apr. 4, 1983, Ser. No. 482,042

Int. Cl.³ A54D *19/04*

U.S. Cl. 4—516 **16 Claims**



1. A portable hair shampoo and scalp treatment basin comprising: a box structure having, a removable top, a bottom, two opposite sides, a back end, and a front end, and with said box being generally of double spaced wall construction having, an outer wall and an inner wall; said outer wall forming said bottom, two opposite sides, the back end, and the front end; said inner wall is connected to said outer wall near the top of said box structure by a peripheral interconnect surface which serves to support said inner wall in a spaced relationship with respect to said outer wall and thus forms a water reservoir between said two walls, said inner wall is formed with a basin cavity at the front user head receiving end of said box structure, and with a convenience tray portion extending generally from the rear of said basin cavity to said interconnect means at the rear of said structure; opening means in said tray portion through which water may be fed to said water reservoir; a rounded cut out in the top of the front end of both said outer and inner walls with said interconnect surface following the contour of said cutout to form a user neck rest mount means for connecting an edge of said removable top to said front end below said cutout to serve as a sloped back rest for a user during a hair shampoo and scalp treatment; wherein fluid drain means extends from said basin cavity through said inner wall and said outer wall and through space between said inner wall and said outer wall; and said water reservoir extending through substantially the length of the basin box and around said basin cavity formed in said inner wall.

4,512,044

PORTABLE SHOWER AND BATH MAT

John T. M. Clark, 1722 Shorelane, R.R. 3, Stayner, Ontario, Canada L0M 1S0

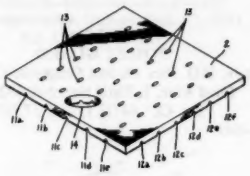
Filed Apr. 2, 1981, Ser. No. 250,161

Int. Cl.³ A47K *3/00*

U.S. Cl. 4—581 **28 Claims**

1. An improved portable shower or bath mat including:

(a) a high density polystyrene pad having an upper surface and also having a channeled bottom surface, wherein at least one of said channels extends to at least one edge of said pad; and



(b) said pad further including a plurality of drain holes, including drain holes extending from said upper surface through said pad to said channels in said bottom surface.

4,512,045

STRUCTURAL ASSEMBLY, FOR SHOWER PARTITION OR THE LIKE

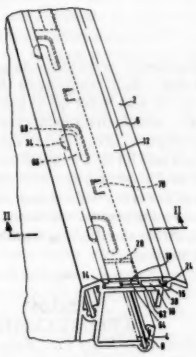
Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach/-Thun, Switzerland

Filed Aug. 26, 1983, Ser. No. 526,825

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232084

Int. Cl.³ A47K *3/22*

U.S. Cl. 4—610 **18 Claims**



1. A structural assembly, for a shower partition or the like, of the type comprising: a support member formed with an elongated first channel having a bottom surface and opposed longitudinal side flanges, one of said side flanges defining a groove opening over said bottom surface; an elongated facing panel fitting into said first channel and having opposed side edges disposed between said channel side flanges, and a connecting element interconnecting said support member and said facing panel, said connecting element engaging into said groove, the improvement wherein:

said facing panel is formed with means defining a second channel opening toward said groove, in interconnected condition of said support member and said facing panel;

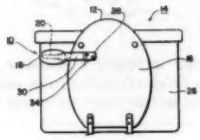
said connecting element, when in said interconnected condition, is mounted partly in said second channel of said facing panel and partly in said groove of said one of said first channel side flanges;

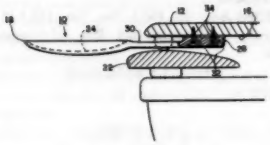
said connecting element is made of resilient material, and

the other of said first channel side flanges and the adjacent edge of said facing panel are formed with interlocking means whereby said panel member with said connecting element inserted in said second channel form a sub-assembly which may be mounted and removed from said support member by pivotal movement of said assembly about

said interlocking means to allow resilient engagement and removal of said connecting elemeht in and out of said groove.

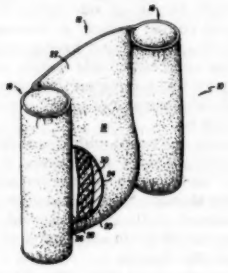
4,512,046
TOILET GUARD
Rita C. Riggle, P.O. Box 19, San Gregorio, Calif. 94074
Filed Mar. 7, 1983, Ser. No. 472,617
Int. Cl.[3] A47K *13/10, 17/00*
U.S. Cl. 4—661 **6 Claims**





1. A combination to prevent flushing a toilet without closing a lid of the toilet, which comprises a toilet lid, a toilet seat and an attachment for said toilet lid to insure closing said lid after use of the toilet, which attachment comprises a member dimensioned and configured at one end to cover a flushing handle for the toilet when said lid is in a raised position, and a second end remote from said covering end attaching said member to said lid so that said covering end extends from said lid and beyond an edge of said toilet seat on the same side thereof as the flushing handle to cover the flushing handle when said lid is in the raised position.

4,512,047
SUPPORT CUSHION
Violet M. Johnson, 21 Kelly Cir., Katonah, N.Y. 10536
Filed Sep. 7, 1983, Ser. No. 530,148
Int. Cl.[3] A47G *9/00;* **A61G** *7/06*
U.S. Cl. 5—432 **2 Claims**



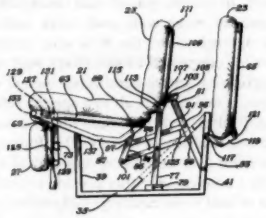
1. A support cushion adapted to be located on a sitting means for gently supporting a person comprising,

a cover having a center portion and two side portions connected to the center portion, said cover including two slits at a bottom between the center portion and the side portion, respectively, adapted to permit a strap to pass therethrough,

a central section to be situated inside the center portion of the cover, said central section including a flat back portion and a front portion and being divided into a lower part and an upper part, said central section being formed of a rectangular central core extending from the lower part to the upper part along the flat back portion and a bottom core connected to the lower part of the front portion so that the front portion gradually rearwardly extends from the lower part toward the upper part thereof and the central core and the bottom core do not move in the cover and stay therein to properly support the back and waist portions of the person, and

two cylindrical bolsters having height substantially the same as the central section, said bolters being arranged vertically relative to the central section and situated inside the side portions of the cover so that the central section and two bolsters respectively support the back and two side portions of a person, and the body of the person can be firmly tightened to the sitting means by the strap which passes across the front of the person and extends to the sitting means through the slits.

4,512,048
VAN SOFA BED
Robert O. Isham, Rte. 2, Box 135-B, Decatur, Tex. 76234, and Wayne S. Reese, 7201 Hovenkamp Ave., Richland Hills, Tex. 76118
Filed Jul. 27, 1983, Ser. No. 517,684
Int. Cl.[3] A47C *17/04*
U.S. Cl. 5—37 R **5 Claims**



1. A sofa bed combination adapted to be mounted in the interior of a van, comprising:

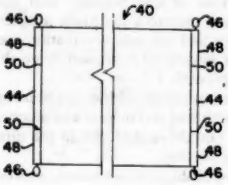
a front cushion, a rear cushion, and an intermediate cushion, the cushions being of the same approximate width;

a rigid frame, less than the width of said cushions;

linkage means for connecting and pivotally mounting said front and intermediate cushions on said rigid frame, whereby said intermediate cushion is pivotable between an upright position which forms a seat back with respect to said front cushion and a folded down position, said folded down position being in the same horizontal plane as said front cushion to form a bed, said rear cushion being pivotally mounted on said rigid frame independently of said front and intermediate cushions and being pivotable between an upright position to provide a storage area behind said sofa bed and a folded down position in the same horizontal plane as said front cushion; and

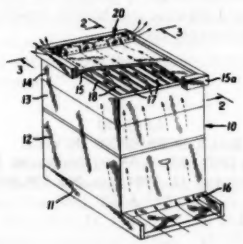
said rigid frame being sized to fit within the interior of said van whereby said front and intermediate cushions form a rear seat for said van when said intermediate cushion is in said upright position and wherein said front, intermediate and rear cushions form a three-section bed when said intermediate and rear cushions are in said folded down position.

4,512,049
RECREATIONAL TOWEL
Jill Henry, 193 Pavahilani Pl., Kailua, Hi. 96734
Filed Jul. 13, 1984, Ser. No. 630,533
Int. Cl.³ A47G 9/06; B32B 3/02
U.S. Cl. 5—417 **1 Claim**



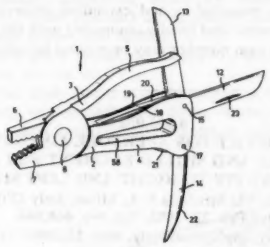
1. A towel comprising,
(a) a generally rectangular sheet of soft, moisture absorbing fabric,
(b) two elongated overlapping portions located along opposite edges of said sheet,
(c) elongated pockets formed at each of the ends of said elongated overlapping portions and being defined by the width of said overlapping portions and a seam thereacross,
(d) loop members extending from the opening of each of said pockets,
(e) means for securing said opening in a closed position, and
(f) spike members being adapted to be driven into an underlying substrate, said spike members fitting within said pockets and secured therein when said securing means is in the closed position, said spikes further being slidable in and engagable with said loops so that when said spikes are removed from said pockets, engaged within said loops and driven into an underlying surface, the towel is secured to said surface.

4,512,050
BEEHIVE VENTILATOR
Matthew Jamison, 4640 Valley Quail La., Santa Rosa, Calif. 95401, and Charles C. Sharp, 1246 Enos Ave., Sebastopol, Calif. 95472
Filed Jan. 25, 1984, Ser. No. 573,808
Int. Cl.³ A01K 47/06
U.S. Cl. 6—1 **10 Claims**



1. A ventilator for a beehive comprising means defining a longitudinally extending vent passage open at at least one end, a base adapted to be mounted to the upper surface of a cover for the beehive, at least one vent opening in said base and communicating with the interior of the beehive beneath the beehive cover, and means accessible from the open end of the vent passage for opening and closing at least one vent opening to control the flow of air from the interior of the beehive to the vent passage.

4,512,051
HANDTOOL
Arthur S. C. Magan, 15, Heytesbury La., Dublin 4, Ireland
Filed Oct. 26, 1982, Ser. No. 436,819
Claims priority, application Ireland, Oct. 27, 1981, 2508/81
Int. Cl.³ B25B 7/22
U.S. Cl. 7—128 **2 Claims**



1. A handtool which comprises: (a) a substantially elongate major body member; (b) a substantially elongate minor body member; (c) at least one inside implement; and (d) an outside implement; each of the body members having a jaw portion in a front end region and a handle portion in a rear end region, the body members being pivotally connected together intermediate their end regions so that they can be rotated relative to each other by manual operation of the handle portions between a closed condition of the body members in which the jaw portions are in abutment with each other and an open condition of the body members in which the jaw portions are spaced apart from each other; the handle portion of the major body member having an inside edge region which faces the handle portion of the minor body member and said handle portion also having an elongate recess in said inside edge region; said at least one inside implement being pivotably mounted on the major body member in the inside edge region and being rotatably displaceable between a rest position in which it is received at least in part in said recess in the inside edge region and a working position in which it extends rearwardly from the body member; the handle portion of the major body member also having a recess in an outside edge region directed away from the handle portion of the minor body member, the outside implement being pivotably mounted on the major body member in the outside edge region and being rotatably displaceable between a rest position in which it is received at least in part in the recess in the outside edge region and a working position in which it extends rearwardly from the body member, and said outside implement having a gripping-surface region which faces outwardly of the body member when the outside implement is in its rest position; and the handle portion of the major body member having in addition an elongate slot-form opening in a side surface thereof, said opening defining a shackle opener; the handtool further comprising detent means for preventing displacement of the implements from their working positions towards their rest positions, each implement having a detent surface in the region of its pivotal mounting on the body member, the detent means comprising at least one detent member displaceable between a blocking position in which it engages a said detent surface to prevent pivoting displacement of the corresponding implement from its working position and a release position in which the implement may be rotated towards its rest position, and the handle portion of the major body member comprising means for holding said at least one detent member in its blocking position and manual means associated with said holding means and selectively operable to allow displacement of the corresponding implement from its working position towards its rest position, said at least one detent member being a spring mounted in the major body member to resiliently engage the corresponding implement in the region of its detent surface, the detent member holding

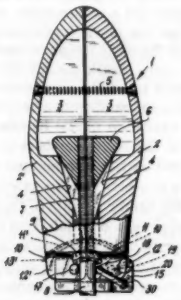
means being a cam member mounted in the major body member for rotation between a locking position in which a cam surface of the cam member engages against a portion of said spring-form detent member to maintain the detent member in its blocking position and a free position in which said spring-form detent member may be displaced into its release position by rotation of the implement, and the manual means being a knob rotatably mounted in and extending outwardly of the major body member and fixedly connected with the cam member, so that the cam member may be rotated by rotation of the knob.

4,512,052

LAST WITH DEVICE FOR APERTURE ADJUSTMENT AS REQUIRED AND SHIELD ELEMENT FOR LAST ADAPTABILITY TO RIGHT AND LEFT SHOES

Bruno, Caminiti, Via Stradella 4/A, Milan, Italy (20129)

Filed Feb. 23, 1983, Ser. No. 468,966
Claims priority, application Italy, Mar. 15, 1982, 21138/82[U]
Int. Cl.³ A43D *5/00*
U.S. Cl. 12—116.2 **5 Claims**



1. A last for controlled stretching of shoes comprising a first half-last and a second half-last, said first and second half-lasts having forward toe portions and opposed rear portions, retaining means for resiliently retaining said half-lasts in closely spaced relation and for allowing lateral adjustment therebetween, and adjustment means for selective lateral adjustment of the two half-lasts relative to each other selectively and individually at at least said toe portions and said rear portions, said adjustment means comprising last manipulation means engaged between said half-lasts and selectively manipulable for a selective movement of said half-lasts relative to each other, said adjustment means further comprising connector means, said connector means extending between said half-lasts and including pivot means for pivotally engaging said half-lasts for enabling pivotal movement of said half-lasts relative to each other about fixed preselected points in response to manipulation of said manipulation means, and means for selectively varying the pivot means for changing said fixed preselected points whereby said adjustment means selectively provides for separate lateral adjustment of said two half-lasts at the toe portions, generally parallel to each other, and at the rear portions.

4,512,053

HAND-HELD SHOE POLISHING APPARATUS

Charles F. Horak, 1700 W. Callighan, and James M. Jordan, Box 172, both of Fort Stockton, Tex. 79735

Filed Nov. 15, 1983, Ser. No. 551,939
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—28 **6 Claims**

1. A hand-holdable apparatus for polishing and buffing shoes comprising:

(a) a housing elongated between front and rear extremities and comprised of interengaged upper portion and lower portion provided with ventillation apertures,

(b) an elongated holding handle disposed above said upper housing portion and oriented substantially parallel to the direction of elongation of said housing,

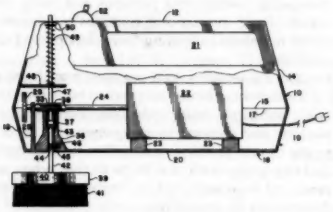
(c) an electric motor and associated drive shaft confined within said housing and oriented such that said drive shaft is substantially parallel to the direction of elongation of said housing and terminates in a distal extremity directed toward the front of said housing, said distal extremity having attached thereto a fan blade adapted to force air past said motor and out said ventillation apertures,

(d) a worm gear associated with said drive shaft in coaxial disposition therewith,

(e) a second gear positioned within said housing in operative engagement with said worm gear and adapted to re-direct the torque of said drive shaft 90° in the direction of said lower housing portion.

(f) a rotary shoe-polishing attachment comprised of a circular head and a spindle perpendicularly attached to the center of said head, said spindle having retention means and first coupling means associated with the upper extremity of said spindle,

(g) a channel in said lower housing portion adapted to accommodate the spindle of said rotary attachment,



(h) second coupling means centrally associated with said second gear and adapted to releasably interengage the first coupling means of said spindle for transmitting torque thereto,

(i) spring-restorable releasing means having an upper extremity extending above said upper housing portion, and a lower extremity positioned within said housing, said upper and lower extremities being misaligned by way of an offset portion, said releasing means being adapted to disengage said spindle from said second gear,

(j) electrical switch means to control the operation of said motor, located adjacent said holding handle, and

(k) an electrical supply cord.

4,512,054

BACK-SCRUBBER DEVICE

Henry S. Clark, 1510 13th St. West, Bradenton, Fla. 33505

Filed Apr. 11, 1984, Ser. No. 599,009
Int. Cl.³ A47K *7/03*
U.S. Cl. 15—222 **20 Claims**

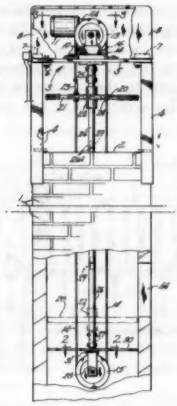
1. A back scrubber comprising:

an elongated cloth member including a central scrubber section and first and second outer hand grasp members respectively extending outwardly from opposite ends of said central scrubber section and wherein said central scrubber section includes transverse pleats alternately extending outwardly therefrom on opposite sides thereof.

4,512,055
CHIMNEY CLEANING APPARATUS WITH MOTOR DRIVE

Burnell G. Boehland, Creswell, and Donald G. Coutts, Eugene, both of Oreg., assignors to Speedy Automatic Chimney Sweep, Inc., Eugene, Oreg.

Filed Nov. 9, 1983, Ser. No. 549,882
Int. Cl.³ F23J *3/00*
U.S. Cl. 15—249 **8 Claims**



1. An apparatus for cleaning the interior of chimneys and the like, said apparatus comprising,

a base for supported placement on a chimney,

a post structure carried by said base and adapted for extending downwardly therefrom for lengthwise placement within the chimney,

a brush assembly slidably disposed on said post for travel therealong,

a brush drive assembly including a flexible member connected to the brush assembly, a first rotatable member on said base, reversible motor means coupled to said first rotatable member to drive same, a second rotatable member carried by said post structure, said flexible member entrained about said first and second rotatable members, motor operation imparting rectilinear movement of said brush assembly along said post to clean the chimney interior, and

a motor control circuit in circuit with a power source to energize said motor for predetermined periods of operation in each direction of operation whereby said brush assembly will traverse the chimney in opposite directions to clean same.

4,512,056
WINDSCREEN WIPER SYSTEM

Maurice F. Wattier, Sissonnes, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France

Filed Feb. 24, 1984, Ser. No. 583,400
Claims priority, application France, Feb. 25, 1983, 83 03149
Int. Cl.³ B60S *1/24*
U.S. Cl. 15—250.23 **19 Claims**

1. In a windscreen wiper system for a motor vehicle comprising:

(a) windscreen wiper blade means;

(b) blade holder arm means for driving said windscreen wiper blade means in an alternating wiping movement in relation to the windscreen surface to be wiped;

(c) intermediary connecting means articulated to the windscreen wiper blade means and to the blade holder arm means;

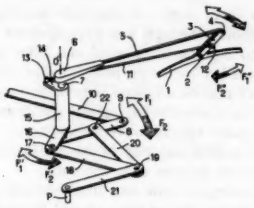
(d) first shaft means having a first axis of rotation and having said blade holder arm means fixed thereto for rotation around said first axis of rotation;

(e) driving crank means for transmitting drive to said first shaft means for executing alternating rotation around said first axis of rotation;

(f) actuator arm means having a first end articulated to the intermediary connecting means for actuating displacement of the intermediary connecting means in relation to the blade holder arm means;

(g) actuator crank means articulated to a second end of said actuator arm means;

(h) second shaft means rotatable about a second axis of rotation, said second shaft means having said actuator crank means fixed thereto for rotation about said second axis;



(i) linkage means drivingly connecting the driving crank means and the second shaft means so that any point along said windscreen wiper blade means follows a non-circular trajectory in the course of wiping rotation of said blade holder arm means;

the improvement wherein said linkage means comprises

(j) a driven crank fixed to the second shaft means

(k) an idler constrained to follow a circular or rectilinear movement;

(l) first and second reversing links articulated to said idler;

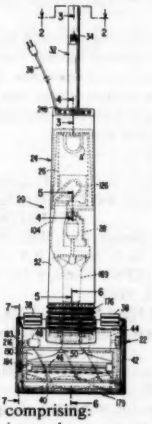
(m) means articulating said driven crank to said first reversing link; and

(n) means articulating said second reversing link to the driving crank.

4,512,057
FLOOR CARE APPLIANCE

Gordon E. Laing; Martin E. Harbeck, both of Anderson; John E. Jones, Greenville; William R. Sumerau, Easley, and William K. Glenn, III, Anderson, all of S.C., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 30, 1984, Ser. No. 605,043
Int. Cl.³ A47L *5/30*
U.S. Cl. 15—320 **3 Claims**



1. A floor care appliance comprising:

a main housing including integral top, rear and side panels,

and further including a large rearwardly open cavity portion extending inwardly between said sides from said rear panel, said cavity portion including an inlet aperture thereto;

a handle for directing said floor care appliance;

means for attaching one end of said handle to an upper portion of said main housing;

a filter arrangement received in said main housing cavity portion, said filter arrangement including a filter bag carried within said cavity portion and an air permeable closure attached to said rear panel and covering said rearwardly open cavity portion;

an internal groove in said main housing beneath said cavity portion; a main housing motor baffle situated in said groove, a motor blower assembly supported by said main housing and said baffle below said cavity portion, said motor blower assembly including an inlet tube extending beyond a lower portion of said main housing and an outlet tube extending through said inlet aperture of said cavity portion to communicate with said filter bag, said main housing further including inlet louvers situated between said cavity portion and said internal groove;

a main housing extension having side panels and a rear panel, said rear panel having louvers therein;

means for attaching said main housing extension to said main housing at the bottom edge thereof;

a cover including integral top, front and side panels and an internal groove spaced from an end thereof;

a cover motor blower baffle captured in said cover internal groove;

means for affixing said cover to said main housing and said main housing extension with said motor blower baffles aligned and extending to said motor blower assembly to provide an inlet chamber for motor cooling air between said cavity portion and said motor baffles and an outlet chamber therefor open to the ambient through said louvers in said main housing extension;

a floor unit including a lower housing supporting a pair of rear wheels, a forwardly situated brush, and a reversible first motor for selectively driving said brush in a selected forward or reverse direction, an upper housing having a chamber for retaining a supply of carpet cleaning powder and supporting a second motor and means for selectively dispensing the powder operatively connected to said second motor, said lower housing further supporting a swivel having an outlet tube for connection to said inlet tube of said motor blower assembly, said swivel fitting communicating with a plenum chamber formed between said upper and lower housing and terminating in a slot adjacent said forwardly situated brush thereof which rotates toward said plenum chamber in said forward direction;

said cover including a switch assembly for selecting operation of said motor blower assembly without operation of said first motor, or operation of said motor blower assembly with operation of said first motor, or operation of said first motor in a reverse direction without operation of said motor blower assembly.

4,512,058

APPARATUS FOR UNHAIRING SLAUGHTERED LIVESTOCK

Günter Abele, Neuler, Fed. Rep. of Germany, assignor to Machinefabriek G. J. Nijhuis B.V., Netherlands

PCT No. PCT/EP81/00050, § 371 Date Jan. 15, 1982, § 102(e) Date Jan. 15, 1982

PCT Filed May 18, 1981, Ser. No. 341,990

Claims priority, application Netherlands, May 16, 1980, 8002849

Int. Cl.³ A22B *5/08*

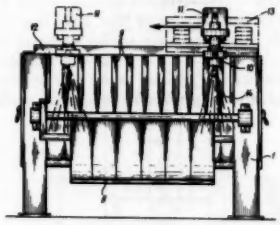
U.S. Cl. 17—20 **14 Claims**

1. Apparatus for unhairing slaughtered livestock, comprising, in combination:

hot water treatment apparatus for treating a carcass with hot water to prepare hairs on the carcass for further hair removal operations;

dehairing apparatus for scraping the carcass, the dehairing apparatus being adapted to receive the carcass and to rotate the carcass, the dehairing apparatus including scrapers, the scrapers being adapted to remove a substantial portion of the hair on the carcass after the hair has been pretreated with hot water; and,

means for differentially heating the carcass after scraping to remove additional hair which is more difficult to remove, without overheating the valuable belly section of the carcass, said means including at least one pivotally mounted burner, the burner being supported by the dehairing apparatus near to the carcass so that the burner can burn away hairs which were not removed by the



scrapers, the burner being pivotally mounted on a pivotal axis, said pivotal axis extending in a direction which is generally transversely oriented with respect to the length of the carcass, so that a flame produced by the burner may be directed up and down at least a portion of the length of the carcass by pivoting the burner about said pivotal axis, the burner being pivotally moveable so that the flame is directed toward the head section of the carcass or the rear section of the carcass for a period of time that is longer than the period of time that the flame is directed toward the belly section of the carcass, the burner being operable to single hair remaining upon the carcass after scraping including hair upon the head section and rear section of the carcass, without overheating the belly section of the carcass, while the carcass is rotated in the dehairing apparatus.

4,512,059

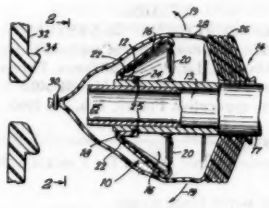
CASING SIZING MEANS AND METHOD

John H. Beckman, Downers Grove, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 9, 1983, Ser. No. 521,590

Int. Cl.³ A22C *7/00, 13/00*

U.S. Cl. 17—45 **20 Claims**



1. A method for diametrically expanding a food casing about the discharge end of a stuffing horn assembly during the stuffing of the casing, said method comprising the steps of:

(a) locating an expandable casing sizing means within an

unshirred, substantially unstretched portion of casing, said sizing means being attachable adjacent the discharge end of the stuffing horn assembly and including a plurality of petal members arranged about the stuffing horn assembly in generally conical configuration wherein each petal member has one end hinged with respect to the stuffing horn assembly to permit arcuate movement of said petal members upward and forward towards the discharge end and to a casing stretching position;

(b) urging the petal members to pivot upward and forward until said petal members are at a position in contact with the inner surface of said unshirred casing but short of said casing stretching position;

(c) moving said unshirred casing over said contacting petal members and toward said discharge end; and

(d) pivoting said petal members to said casing stretching position in direct response to said casing movement.

4,512,060

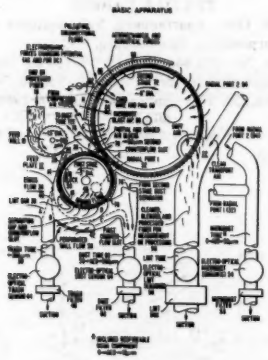
APPARATUS AND METHODS FOR AEROMECHANICAL AND ELECTRODYNAMIC RELEASE AND SEPARATION OF FOREIGN MATTER FROM FIBER

Frederick M. Shofner, Knoxville, Tenn., assignor to ppm, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 428,608, Sep. 30, 1982, abandoned. This application Nov. 15, 1983, Ser. No. 552,061

Int. Cl.³ D01B *3/00*

U.S. Cl. 19—200 **14 Claims**



1. Apparatus for removing foreign matter from bulk fiber material, said apparatus comprising:

a perforated cylindrical rotating beater wheel having perforations for permitting radially inward airflow and having projections for engaging fibers on said beater wheel, the perforations being sufficiently small to substantially preclude movement of lint through the perforations;

a mechanism for continuously supplying bulk fiber material to said beater wheel at a first point along the rotational path thereof;

a mechanism for continuously removing the lint mat from said beater wheel at a second point along the rotational path thereof; and

a port for withdrawing transport gas from the interior of said cylindrical beater wheel to provide aerodynamic force tending to pull fiber and foreign matter towards the cylindrical surface of said beater wheel.

4,512,061

METHOD OF CONTROLLING FIBER-DRAWING APPARATUS

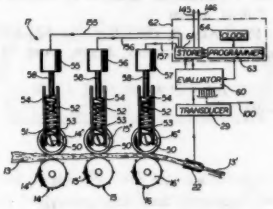
Max Hartmannsgruber, Kirchheim; Kurt Kriechbaum, Ingoldstadt; Günter Schulz, Ebersbach, and Hermann Güttler, Uhingen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Division of Ser. No. 420,787, Sep. 21, 1982, Pat. No. 4,473,924, which is a continuation-in-part of Ser. No. 196,582, Oct. 14, 1980, abandoned. This application Apr. 13, 1984, Ser. No. 600,310

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941612

Int. Cl.³ D01H *5/42*

U.S. Cl. 19—239 **3 Claims**



1. A method of controlling the operation of a draw frame with a plurality of cascaded roller pairs following one another in a direction of travel of sliver to be combined into an outgoing bundle, said roller pairs being rotated at relative speeds imparting tension to the bundle between the portion clamped in the nips of each pair of rollers, wherein the improvement comprises the steps of:

(a) sensing thickness fluctuations of said bundle;

(b) successively varying the nip line spacing between roller pairs;

(c) for each nip line spacing thus established, maintaining the nip line spacing constant and measuring the extent of said fluctuations;

(d) ascertaining the nip line spacing for which said fluctuations as measured in step (c) are at a minimum; and

(e) maintaining the nip line spacing as the ascertained value of step (d) for continued operation of the draw frame.

4,512,062

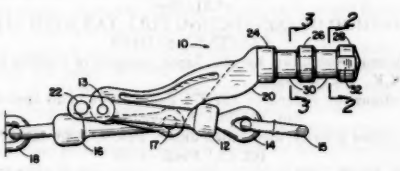
LOAD BINDER HANDLE AND EXTENSION THEREFOR

Edward J. Crook, Jr., Tulsa, Okla., assignor to The Crosby Group, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 357,048, Mar. 11, 1982,. This application Dec. 21, 1982, Ser. No. 451,871

Int. Cl.³ A47B *95/02;* **B66F** *3/00*

U.S. Cl. 24—71 R **5 Claims**



1. In a load binder for applying tension to a chain or other flexible load retaining element wherein said load binder comprises at least two link members each adapted to attach to said chain or other flexible element, said link members being pivotally interconnected to an actuator link that pivots between a relatively extended slack chain position and a relatively re-

tracted chain tension position wherein said actuator link being adapted to lock over-center thus holding said chain or said flexible member under said tension, the specific improvement comprising:

said actuator link comprised of a toggle arm and a handle rigidly formed thereto, said handle being substantially a hand-breadth in length; and

a removable extension, said extension including means at one end to interconnect and interlock with said handle and means at the other end to release said over-center locking tension position.

4,512,063

BUTTON

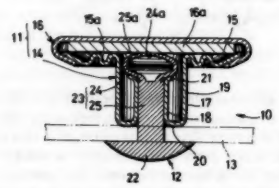
Takeo Fukuroi, Uozu, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,339

Claims priority, application Japan, Aug. 11, 1982, 57-121754[U]

Int. Cl.³ A44B *1/42, 17/00*

U.S. Cl. 24—94 **6 Claims**



1. A button for attachment to a garment fabric, comprising:

(a) a button body including a button back and a cap covering said button back on its one obverse side, said button back having a hollow hub integral therewith and disposed remotely from said cap and projecting centrally from said button back;

(b) a one-piece tack member including a head, and a shank of a circular cross section projecting perpendicularly and centrally from said head for being pierced through the garment fabric and then inserted into said hollow hub of said button back to thereby join said tack member with said button body; and

(c) said shank having a hollow and solid combined structure that is composed of a closed tapering hollow end portion and a solid base portion, said hollow end portion being deformable into a balloon-like shape, axially compressed and radially swelled, as its tip end is forced against the inner side of said cap of said button body during the insertion of said shank into said hollow hub of said button back.

4,512,064

METHOD OF CONNECTING PULL TAB WITH SLIDE FASTENER SLIDER

Kiyotada Nishikawa, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 221,976, Jan. 2, 1981,. This application Jan. 12, 1984, Ser. No. 570,219

Claims priority, application Japan, Feb. 9, 1980, 55-15729

Int. Cl.³ A44B *19/00*

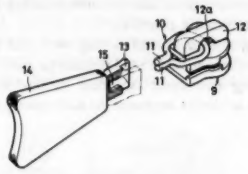
U.S. Cl. 24—429 **3 Claims**

1. A method of connecting a planar pull tab having at one end an axial hole extending in from a transverse recess with a slide fastener slider having a bridge with an opening therein, comprising the steps of:

forming a piece of resilient wire into a closed planar loop with two straight wire end portions projecting outwardly from said loop, said wire end portions being parallel, juxtaposed in contact and overlying one another in a plane generally perpendicular to the plane of said loop,

separating said end portions sufficiently to thread one end portion through said opening in the bridge of said slider to interlink said wire loop with said slider,

inserting said juxtaposed wire end portions into said transverse recess of said pull tab with the plane of said wire end portions generally coinciding with the plane of said pull tab and with the plane of said loop generally perpendicular to the plane of said pull tab,



turning said pull tab approximately 90° about its longitudinal axis relative to said loop whereby said wire end portions are displaced relative to one another so as to be aligned with one another in the general plane of said loop,

moving said pull tab and loop relatively toward one another to insert said wire end portions into said axial hole of said pull tab and bring an adjacent portion of said loop in said recess, and

securing said wire loop to said pull tab.

4,512,065

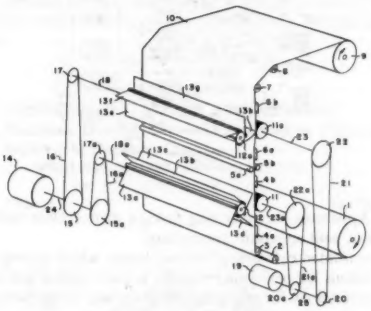
MECHANICAL SURFACE FINISHING APPARATUS FOR TEXTILE FABRIC

Wolfgang K. F. Otto, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 282,446, Jul. 13, 1981, Pat. No. 4,468,844, which is a continuation-in-part of Ser. No. 92,815, Nov. 9, 1979, Pat. No. 4,316,928. This application Apr. 27, 1984, Ser. No. 604,771

Int. Cl.³ D06C *11/00*

U.S. Cl. 26—28 **5 Claims**



1. An apparatus for mechanically achieving a substantially uniform modification of the hand characteristics of a textile fabric having fibrous components which comprises means for continuously feeding said fabric from a source of supply such that said fabric lies in a single plane, at least one rotating abrasive roll; at least one intermittent impact means for subjecting successive adjacent sections of said fabric to intermittent mechanical impact with said abrasive roll across the width of said fabric, thereby avoiding substantial sustained contact between said fabric and said abrasive roll; said intermittent mechanical impact means being disposed across the fabric width, parallel

to the abrasive roll near the reverse side of the fabric from said abrasive roll, thereby causing the portions of the fibrous components exposed to said intermittent mechanical impact with said abrasive roll to be substantially scarred and to be provided with a multiplicity of generally short, rather thick, lamella shaped protrusions extending therefrom.

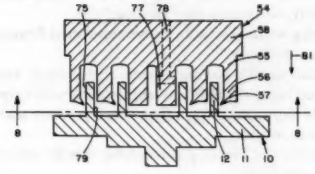
5. An apparatus for mechanically achieving a substantially uniform modification of the hand characteristics of a textile fabric having fibrous components which comprises means for continuously feeding said fabric from a source of supply such that said fabric lies in a single plane, at least one rotating abrasive roll covered with napping wire; at least one intermittent impact means for subjecting successive adjacent sections of said fabric to intermittent mechanical impact with said abrasive roll across the width of said fabric thereby avoiding substantial sustained contact between said fabric and said abrasive roll; said intermittent mechanical impact means being disposed across the fabric width, parallel to the abrasive roll near the reverse side of the fabric from said abrasive roll, thereby causing the portions of the fibrous components exposed to said intermittent mechanical impact with said abrasive roll to be substantially scarred and to be provided with a multiplicity of generally short, rather thick, lamella shaped protrusions extending therefrom.

4,512,066

METHOD OF FABRICATING SCROLL MEMBERS

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 2, 1981, Ser. No. 239,414
Int. Cl.³ B23D *15/02*
U.S. Cl. 29—23.5 **10 Claims**



1. A method of fabricating a scroll member comprising the steps of

(a) providing a precision preformed scroll member as an element having affixed to an end plate an involute wrap having its inner and outer flanks joined to said end plate along the base of said involute wrap;

(b) forming reentrant corners between the surface of said end plate and said inner and outer flank surfaces joining said involute wrap to said end plate;

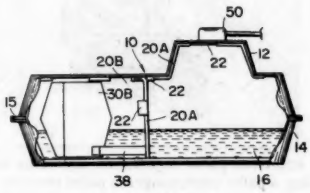
(c) broaching said inner and outer flanks of said involute wrap axially toward the surface of said end plate to attain a predetermined thickness of said involute wrap and a radial spacing between the turns thereof, said reentrant corners providing clearance for chips resulting from said broaching.

4,512,067

METHOD OF MAKING LIQUID CONTAINER HAVING ELECTRODE PLATES TO DETECT LIQUID LEVEL BY MEASURING CAPACITANCE

Hiroshi Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 330,782, Dec. 14, 1981,. This application Mar. 20, 1984, Ser. No. 591,238
Claims priority, application Japan, Dec. 15, 1980, 55-175875; Dec. 29, 1980, 55-188969; Aug. 27, 1981, 56-133274
Int. Cl.³ H01G *7/00*
U.S. Cl. 29—25.41 **14 Claims**



1. A method of producing, in a liquid container having a hollow container body, a plurality of capacitors electrically connected in parallel and disposed in the container body such that the capacitance of each capacitor varies as the level of liquid in the container body varies, each of the capacitors having an electrode plate assembly including two generally polygonal electrode plates arranged opposite to and spaced from each other and disposed substantially vertically in the container body, the method comprising the steps of:

for each electrode plate assembly, preparing a provisional assembly of a first electrode plate having a plurality of holes and a shape enabling it to serve as a baffleplate, placing a second electrode plate opposite to said first electrode plate, the second plate having a plurality of holes correspondingly to said holes of said first electrode plate, inserting a spacer network between said first and second electrode plates to provide a predetermined distance between said first and second electrode plates, said spacer network being a one-piece member formed of an electrically insulating material and including plural generally annular spacers arranged correspondingly to said holes of said first and second electrode plates, said spacer having a thickness equal approximately to said distance and a plurality of relatively thin connecting bars each extending in a zigzag manner to breakably connect a predetermined number of said spacers to one another by relatively weak joints with a generally arc-like part of the outer periphery of each spacer, said spacer having an end portion protruding from the space between said first and second electrode plates, inserting a fastener in the center hole of each spacer through the aligned holes of said first and second electrode plates, and fixing each of said fasteners to said first and second electrode plates;

pulling each of said connecting bars at said end portion to cause the joints between the pulled connecting bar and each of said number of spacers to break to thereby separate the pulled connecting bar from all of said number of spacers, and then removing the separated connecting bar from said provisional assembly, whereby said provisional assembly is converted into said electrode plate assembly, wherein said plurality of spacers remain sandwiched between said first and second electrode plates and are spaced from one another; and

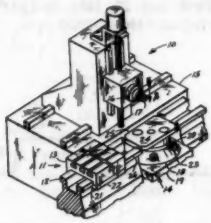
substantially vertically disposing each electrode plate assembly in said container body at a predetermined location, and fixing said first electrode plate of each electrode plate assembly to said container body.

4,512,068

PALLET RECEIVER WITH COMPLIANT PIN AND SOCKET REGISTRATION

Tadeusz W. Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 23, 1982, Ser. No. 178,922
Int. Cl.³ B23Q *1/28, 7/14, 41/02*
U.S. Cl. 29—33 P **3 Claims**



1. An improved pallet registration apparatus in a machine tool having: a pallet interchanger; a pallet receiver with a base adapted to receive a pallet from said interchanger; and means to clamp and release said pallet at said receiver at selected interchange times, wherein the improvement comprises:

(a) a first rigid locating surface on said receiver base;

(b) a second rigid locating surface on said pallet;

(c) a registration socket located on one of said pallet and receiver;

(d) a registration pin matingly-shaped to said socket, located on the other of said pallet and receiver; and

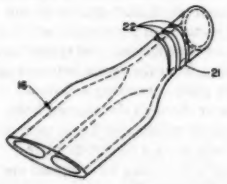
(e) diaphragm spring mounting means supporting one of said pin and said socket; wherein said pallet is moved and aligned through engagement of said pin and socket during a first portion of clamp means movement, and is subsequently stationarily held and clamped through engagement of said first and second rigid surfaces during a second portion of clamp means movement.

4,512,069

METHOD OF MANUFACTURING HOLLOW FLOW PROFILES

Klaus Hagemeister, Ebenhausen, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 444,200
Int. Cl.³ B21K *3/04;* B23P *15/02, 15/04;* B21D *53/02*
U.S. Cl. 29—156.8 B **4 Claims**



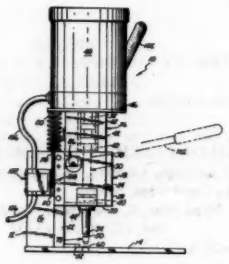
1. A method for manufacturing hollow heat exchanger matrix flow profiles of aerodynamic configurations, said profiles each having an outer skin streamed about during operation by a first working medium, and internal passages in the flow profiles simultaneously streamed through by a second working medium; comprising the steps of forming material accumulations at predetermined locations spaced over the circumference of a conduit of an initially predetermined sectional configuration; deforming said conduit so that one of the material accumulations produces a side thickening of the wall being formed proximate the area of the leading and trailing edges of the flow profile, and further deforming said conduit so that other material accumulations produce inner webs superimposed in the meridian plane ultimately to provide at least two separate compressed air passages, said forming step further including providing two diametrically opposite material accumulations on the circumference of the conduit of the same web-like configuration before the final forming of the profile and a projectile structure on the conduit wall; inserting turbulence-inducing metal means between the adjacent ends of the inner webs of the finish-formed flow profiles, and fastening said turbulence-inducing metal means together with the ends of the inner webs, as an internal structural component of the flow profile; effecting the final finish forming through pressing the inner webs together and welding them together.

4,512,070

SAW CHAIN RIVET SPINNER

Richard C. Anhalt, Rte. 9, Box 1B, Brainerd, Minn. 56401

Filed Jun. 1, 1983, Ser. No. 499,816
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.53 **18 Claims**



1. A rivet spinner for saw chain rivets which comprises:

a generally horizontal base portion;

a generally vertical spindle sleeve supported from and above the base portion;

a rotatable spindle having a generally vertical axis of rotation and being slidably movable axially with respect to the spindle sleeve between a first raised position and a second lowered position;

spring means for urging the rotatable spindle toward its first raised position;

manually actuated cam means for selectively moving the rotatable spindle from its first raised position to its second lowered position;

a rivet support die mounted on the base portion, the support die being axially aligned under the rotatable spindle and formed to support a saw chain rivet;

a rivet anvil fixedly secured on a lower end of the rotatable spindle for engaging the rivet supported by the support die when the spindle is moved to its second lowered position;

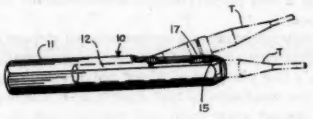
motor means for rotating the spindle and rivet anvil; and

switch means for actuating the motor means, the switch means being responsive to the position of the rotatable spindle such that the motor means is only actuated when the spindle is moved downwardly out of its first raised position toward its second lowered position.

4,512,071
TOOL HOLDER

Russell F. Fieberg, Westminster, and Donald E. Fieberg, Sunset Beach, both of Calif., assignors to Russtech Engineering Company, Inc., Huntington Beach, Calif.

Filed Jan. 24, 1983, Ser. No. 432,242
Int. Cl.³ B25G 3/02
U.S. Cl. 29—278 1 Claim



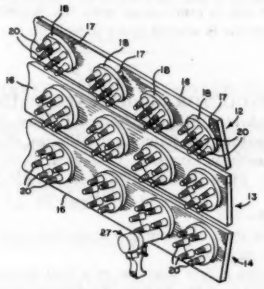
1. An elongate tool holder of a resilient material structure for retaining insertion and extraction tools useful in inserting and extracting electrical leads from a connector structure, said tool being characterized by two opposed frustoconical segments extending from a central grasping section provided with a rectangular enlargement all formed as a unitary structure of a resilient material, comprising:

an elongate handle provided with a circular central bore extending along the longitudinal axis thereof conformed to receive said frustoconical segments and a rectangular lateral cavity transversely extending into said bore for receiving said rectangular enlargement of said grasping section proximate one end of said handle, said handle further including a lateral cut-off surface over said lateral cavity in alignment over said grasping section enlargement, exposing a lateral gap in the surface of said central bore of a dimension smaller than the transverse dimension of either one of said frustoconical segments.

4,512,072
APPARATUS FOR INSTALLING POULTRY FEATHER PICKING FINGERS

Johnny R. Graham, Rte. 8, Gainesville, Ga. 30501

Filed May 9, 1983, Ser. No. 493,054
Int. Cl.³ B66F 15/00
U.S. Cl. 29—252 7 Claims

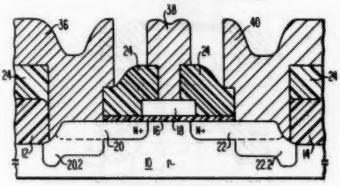


1. Apparatus for seating a resilient picking finger in a support hole of a poultry feather picking machine comprising, in combination, a housing having an open end adapted to be placed against the support about the hole; a tubular sleeve mounted for reciprocal movement within said housing and carrying collet camming means; a collet slidably mounted within said sleeve having an annularly arranged set of resilient collet fingers positioned adjacent said collet camming means; pressurized fluid drive means for moving said sleeve within said housing, spring means for biasing said collet toward said collet camming means, and stop means mounted to said housing for limiting movement of said collet toward said housing open end whereby the housing open end can be placed against the machine support about the support hole with the collet positioned about the shank of a poultry picking finger extending through the support hole and upon activation of the pressurized fluid drive means the picking finger gripped and pulled by the collet and seated within the support hole.

4,512,073
METHOD OF FORMING SELF-ALIGNED CONTACT OPENINGS

Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 23, 1984, Ser. No. 582,752
Int. Cl.³ H01L 21/265, 21/28
U.S. Cl. 29—571 6 Claims



1. In a process for forming a self-aligned contact opening in a semiconductor device, the device having a semiconductor substrate of a first conductivity type, a gate insulator layer formed on the surface of the substrate, a gate member formed on a portion of the surface of the insulator layer, a source region and a drain region of a second opposite conductivity type formed in the substrate at the surface thereof and having their facing edges aligned with the edges of the gate member, the gate member and the remainder of the gate insulator layer being covered with a second insulator layer, the improved process comprising the following steps, in the following order:

forming openings in the second insulator layer and in the gate insulator layer to expose a portion of the source region, a portion of the drain region and a portion of the gate member, wherein, after etching, any misalignment of the apertures, with respect to the source and drain regions, exposes portions of the substrate adjacent the source and/or drain regions;

implanting a second type conductivity modifier through the apertures into the source and drain regions and into any exposed area of substrate;

heating the substrate to anneal implantation damage and to cause the implanted conductivity modifiers to migrate laterally and deeper into the substrate; and

depositing conductive material into the apertures to form ohmic contacts with the source and drain regions, the gate member and any previously exposed area of substrate.

4,512,074
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING SELECTIVE OXIDATION AND DIFFUSION FROM A POLYCRYSTALLINE SOURCE

Gen Sasaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 2, 1983, Ser. No. 528,793
Claims priority, application Japan, Sep. 9, 1982, 57-157023
Int. Cl.³ H01L 21/225, 21/76
U.S. Cl. 29—576 W 4 Claims

1. A method for manufacturing a semiconductor device, comprising the steps of:

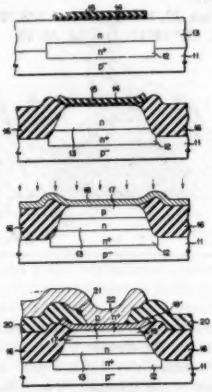
selectively oxidizing a surface of a semiconductor layer of a first conductivity type so as to form a field oxide film;

selectively forming an impurity region of a second conductivity type in an element region isolated by said field oxide film;

forming a polycrystalline silicon pattern containing an in-

purity of the first conductivity type on a surface including at least part of said impurity region and said field oxide film; and

diffusing the impurity of the first conductivity type from said polycrystalline silicon pattern into said impurity region so as to form another impurity region of the first conductivity type contiguous with said field oxide film;



wherein a thickness t of said field oxide film and a concentration n of the impurity of the first conductivity type in said polycrystalline silicon pattern have the following relation:

$$t(\mu m) \leqq -0.117\times10^{-20}(\mu m\text{-}cm^3)\cdot n(cm^{-3})+1.42(\mu m)$$

for $1\times10^{19} \leqq n(cm^{-3}) \leqq 1\times10^{21}$.

4,512,075

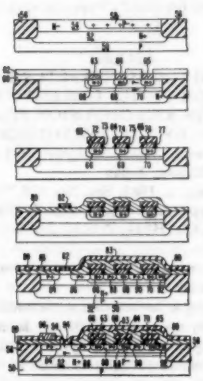
METHOD OF MAKING AN INTEGRATED INJECTION LOGIC CELL HAVING SELF-ALIGNED COLLECTOR AND BASE REDUCED RESISTANCE UTILIZING SELECTIVE DIFFUSION FROM POLYCRYSTALLINE REGIONS

Madhukar B. Vora, Los Gatos, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 106,428, Aug. 4, 1980, abandoned. This application Jul. 28, 1983, Ser. No. 517,564

Int. Cl.³ H01L *21/225, 21/31*

U.S. Cl. 29—577 C **7 Claims**



1. A method of fabricating a semiconductor structure having a lateral transistor and a plurality of vertical transistors in a device region of a first conductivity type in a semiconductor body along a surface thereof, the method comprising the steps of:

introducing a first semiconductor dopant of a second conductivity type opposite to the first conductivity type into a portion of the device region along the surface to form a doped region of the second conductivity type;

forming a first polycrystalline semiconductor layer on the surface;

selectively introducing a semiconductor dopant of the first conductivity type into (1) the first polycrystalline layer to form a like plurality of doped polycrystalline portions of the first conductivity type extending to the doped region and spaced apart from one another and (2) the doped region to form a like plurality of vertical current-conducting regions of the first conductivity type corresponding on a one-to-one basis to the polycrystalline portions and lying therebelow;

selectively subjecting the first polycrystalline layer to a first oxidizing environment to form a top electrically insulating covering at the exposed surface of each polycrystalline portion;

removing the remainder of the first polycrystalline layer except for a non-oxidized polycrystalline segment of each polycrystalline portion;

subjecting the polycrystalline segments to a second oxidizing environment to form a side electrically insulating covering at each exposed surface of each polycrystalline segment so as to define a composite covering for each polycrystalline segment comprising its top and side coverings and to leave a first electrically conductive line for each polycrystalline segment comprising its non-oxidized remainder;

forming a second polycrystalline semiconductor layer on the composite coverings and over the exposed sections of the device region; and

selectively introducing a second semiconductor dopant of the second conductivity type into (1) the second polycrystalline layer and (2) the device region therebelow to form a pair of lateral current-conducting regions of the second conductivity type spaced apart from each other, of which a first one is continuous with the doped region and the second one is spaced apart therefrom.

4,512,076

SEMICONDUCTOR DEVICE FABRICATION PROCESS

Deepak Mehrotra, Milpitas; Gerard J. Shaw, San Jose; Jok Y. Go, Sunnyvale, and Rajni Kant, Milpitas, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 20, 1982, Ser. No. 450,900

Int. Cl.³ H01L *21/86*

U.S. Cl. 29—578 **3 Claims**

1. The method of forming a semiconductor structure comprising the steps of:

(a) forming a first window in a first silicon dioxide layer disposed over the surface of a silicon semiconductor layer to expose a first portion of the silicon layer;

(b) forming a doped region in the first portion of the silicon layer exposed by the first window;

(c) disposing a second layer of silicon dioxide over the surface of the first previously formed silicon dioxide layer and over the first portion of the silicon layer exposed by the first window;

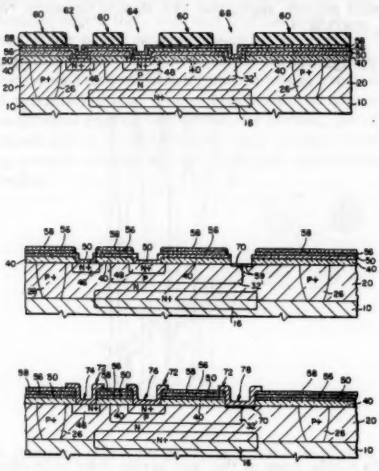
(d) forming a second window through the first and second silicon dioxide layers to expose a second, different portion of the surface of the silicon layer;

(e) disposing a layer of silicon nitride over the second layer of silicon dioxide and through the second formed window onto the portion of the silicon layer exposed by such second formed window;

(f) forming a mask over the silicon nitride layer with win-

dows disposed over the first and second previously exposed portions of the silicon layer;

(g) bringing an etchant into contact with portions of the silicon nitride layer exposed by the windows formed in the mask to selectively remove said portions of the silicon nitride layer exposed by such windows to expose the portion of the second silicon dioxide layer disposed over



the first exposed portion of the silicon layer and to expose the second exposed portion of the silicon layer;

(h) forming a Schottky contact with the second exposed portion of the silicon layer; and,

(i) selectively removing the portion of the second silicon dioxide layer disposed over the first portion of the silicon layer to expose a portion of the previously formed doped region.

4,512,077

ELECTRIC SHAVER HAVING IMPROVED SHAVING CHARACTERISTICS

Toshio Tanabe, and Masakazu Kita, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 21, 1983, Ser. No. 460,052

Claims priority, application Japan, Jan. 26, 1982, 57-10779

Int. Cl.³ B26B *19/06, 19/38*

U.S. Cl. 30—43 **12 Claims**

1. An electric shaver comprising:

a housing;

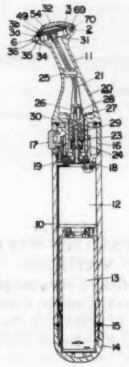
a shaving head projecting from an upper end of said housing;

a shaving blade having a front shaving edge extending laterally along a front end of said head, said front edge of said shaving blade projecting from said front end of said head, said shaving blade comprising a fixed blade which has at a front end thereof a comb-shaped edge comprising a number of small teeth arranged laterally side by side and which is fixed in a predetermined position at said head, and a movable blade which has a comb-shaped edge in slidable contact with said comb-shaped edge of said fixed blade and which is movable in reciprocation laterally of said head;

a comb having a number of combing teeth arranged laterally side by side and positioned below said front shaving edge of said shaving blade;

an edge cover provided above said shaving blade for abutting against skin when said shaver is in use to regulate, together with said comb, an angle which the edge of said shaving blade makes with respect to said skin; and

a front edge of said edge cover, and a front end of said comb



being aligned on a straight line in a plane perpendicular to and cutting said front edge of said edge cover, said front shaving edge of said shaving blade and said front end of said comb.

4,512,078

JIG SAW WITH ORBITAL MECHANISM

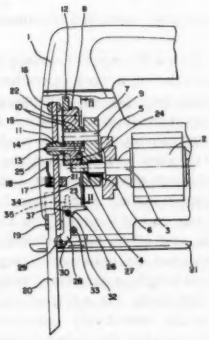
Gerhard Pfanzer, Camberg, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 19, 1983, Ser. No. 486,529

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 8211249[U]

Int. Cl.³ B27B *11/02*

U.S. Cl. 30—393 **18 Claims**



1. A jig saw, comprising:

a housing;

a reciprocating saw blade assembly pivotally supported by said housing;

an engagement element pivotally supported by said housing for engaging said saw blade assembly to generate pivotal movement thereof;

actuating means for pivoting said engagement element;

drive means for simultaneously reciprocating said saw blade assembly and driving said actuating means;

adjusting means for displacing the pivotal axis of said engagement element to determine the pivotal movement of said saw blade assembly; and

said engagement element comprising a bell crank one arm of

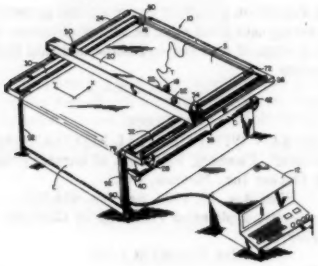
which is acted upon by said actuating means and the other arm of which carries a roller which engages said saw blade assembly.

4,512,079

METHOD AND APPARATUS FOR INDEXING SHEET MATERIAL

Claude W. LeBlond, Enfield, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Jul. 21, 1983, Ser. No. 515,638
Int. Cl.³ B65H *17/36*
U.S. Cl. 33—1 M **13 Claims**



1. An automatically controlled instrument system comprising:

a work table with a flat support surface on which a sheet of material rests during a work operation,

a work carriage carrying an instrument and mounted for movement over the support surface in a given direction to enable the instrument to perform work operations on the material at selected locations over the table;

a material advance mechanism for indexing the material over the support surface in the given direction from a feed position at one end of the table to a discharge position at the opposite end of the table whereby continuous work can be produced on consecutive segments of material having a total length greater than the length of the table in the given direction, the advance mechanism including coupling means operatively associated with the work carriage for engaging the material, and control means for moving the carriage, the coupling means, and the engaged material in the given direction across the support surface from the feed position toward the discharge position at a controlled speed and further including

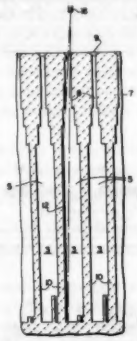
tensionless receiving means associated with the discharge position of the table for receiving the material discharged from the support surface by the advance mechanism without tension or distortion, the receiving means including a take-up roll onto which the material is wound from the table, and a take-up drive motor connected in driving relationship with the take-up roll and operated at a speed less than the controlled speed of the work carriage and engaged material to receive the material on the take-up roll from the support surface in a tensionless condition.

4,512,080

METHOD AND APPARATUS FOR MEASURING THE FLEXURE OF A HEATING WALL OF A COKE OVEN DURING OPERATION THEREOF

Dietrich Wagener, and Manfred Blase, both of Essen, Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,426
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242338
Int. Cl.³ G01B *21/16*
U.S. Cl. 33—125 T **20 Claims**



1. In a coke oven of the type having coke oven chambers separated by a heating wall having therein at least one heating flue defined by stretcher and binder walls of said heating wall, and an oven roof covering said coke oven chambers and said heating flue, wherein during operation of said coke oven said heating wall is flexed, the improvement of means for determining during operation of said coke oven the amount of flexure of said heating wall, said determining means comprising:

an observation hole through said oven roof into said heating flue, said observation hole having an axis;

at least one vertical measuring strip formed on at least one of said binder walls and extending throughout substantially the entire height thereof at a position to be visible through said observation hole; and

said measuring strip defining, prior to heating of said heating wall during operation of said coke oven, a rectilinear measuring line extending parallel to and spaced from said axis of said observation hole;

whereby, upon heating of said heating wall during operation of said coke oven said binder wall will be flexed, and the degree of such flexure may be determined by the extent of deviation of said measuring strip from said measuring line.

4,512,081

TRAMMEL HEAD ASSEMBLY

Hong K. Park, 300 Harolds Dr., Huntsville, Ala. 35806

Continuation-in-part of Ser. No. 383,738, Jun. 1, 1982, abandoned. This application Sep. 26, 1983, Ser. No. 535,640
Int. Cl.³ B43L *9/04*
U.S. Cl. 33—27 C **12 Claims**

1. A trammel assembly adapted to accommodate variously dimensioned, elongated, generally flat scales having singular cross sections, comprising:

a trammel head assembly comprising:

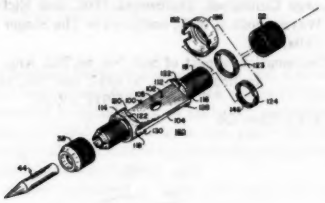
a central body region having a first inset elongated flat portion and a second oppositely positioned inset elongated flat portion sized smaller than said first portion, each said flat portion being adapted to separately receive a said scale,

a first externally threaded region extending from one end of said central body region, and a second externally threaded

region extending from an opposite end of said central body region and having a tubular interior,

first guide means forming a part of said central body region for guiding a said scale adjacent to said first flat portion, said first guide means comprising a first pair of oppositely spaced lip members positioned adjacent to longitudinal ends of said first flat portion, one of said first pair of lip members forming a first slot extending into said first threaded region flush with said first flat portion,

second guide means forming a part of said central body region for guiding a said scale adjacent to said second flat portion, said second guide means comprising a second pair of oppositely spaced lip members positioned adjacent to longitudinal ends of said second flat portion, one of said second pair of lip members forming a second slot extending parallel to said first slot flush with said second flat portion,



first clamping means for applying a force parallel to each said flat portions of said central body region and against a said elongated scale, said first clamping means comprising:

a first nut threadably engagable with said first threaded region, and

an annular collar extending around said first threaded region and around said slot in said first threaded region, said collar engaging a said scale inserted within one of said slots, wherein said collar and a flat region together engage and secure a said scale, and

second clamping means including a second nut threadably engagable on said second threaded region for clamping a workpiece engaging member within said tubular interior;

an index positioned on one lip member of each said pair of lip members and said index coinciding with a plane centrally through said tubular interior; and

a workpiece engaging member positioned and held within said tubular interior.

4,512,082

ERROR CORRECTION ARRANGEMENT FOR DIGITAL LENGTH OR ANGLE MEASURING DEVICE

Horst Burkhardt, Truchtlaching, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,586

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208591

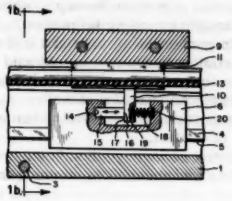
Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 R **19 Claims**

1. In a digital position measuring system for measuring the relative position of two objects, of the type comprising a measuring scale secured to the first object, a scanning unit, and means for coupling the scanning unit to move with the second object to scan the scale, the improvement comprising:

means for generating an electric correction signal which varies in accordance with a desired error correction course; and

electrically responsive means, included in the coupling means, for varying the separation between at least a portion of the scanning unit and the second object in accordance with the electric correction signal in order to correct the relative position of the at least a portion of the scanning unit with respect to the second object.



4,512,083

MEASURING APPARATUS

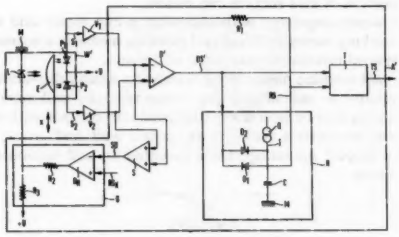
Walter Schmitt, Traunreut, and Dieter Michel, Traunstein, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,626

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301256

Int. Cl.³ G01B *7/02, 11/02*

U.S. Cl. 33—143 L **14 Claims**



1. In combination with a measuring apparatus for measuring the relative position of two objects, said apparatus comprising a transducer for converting a mechanical input into an analog electrical signal, the improvement comprising:

a trigger stage having first and second inputs and an output;

a reference signal stage having an input and an output;

means for applying the analog signal to the first input of the trigger stage and to the input of the reference signal stage;

means, included in the reference signal stage, for generating a reference signal on the output of the reference signal stage, which reference signal is dependent on the analog signal; and

means for applying the reference signal to the second input of the trigger stage;

the trigger stage generating a trigger signal at its output in response to a change in the analog signal resulting from a change in the mechanical input.

4,512,084

PICTURE HANGING MARKER

Steven Lieberman, 17 Sunset Dr., Bedford Hills, N.Y. 10507

Filed Jan. 11, 1984, Ser. No. 570,077

Int. Cl.³ G01B *3/02*

U.S. Cl. 33—180 R **8 Claims**

1. A wall marker for marking a desired location on a wall for a support for an object, said support being of the type which

may be affixed to a wall and used to hold an object on said wall, said wall marker comprising

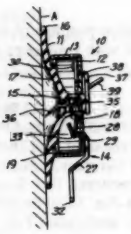
(a) suction cup means,

(b) said suction cup means having a central concave portion and an axially extending lip portion,

(c) said lip portion being arranged and configured to uniformly contact said wall whereby said suction cup means forms an airtight seal with said wall when said suction cup means is placed against said wall,

(d) said lip portion and said wall, when in contact, defining a plane of contact,

(e) said central concave portion being arranged to face said wall when said suction cup means is in contact with said wall,



(f) a marking means mounted upon said suction cup means and extending within the confines of the central concave portion of said suction cup means,

(g) means associated with said suction cup means and said marking means to retain said marking means in a normally spaced relation to said plane of contact,

(h) said marking means being selectively axially displaceable relative to said suction cup means whereby said marking means may be selectively displaced into contact with said wall to create a visible mark on said wall, and

(i) a support mounting means mounted on said suction cup means.

4,512,085

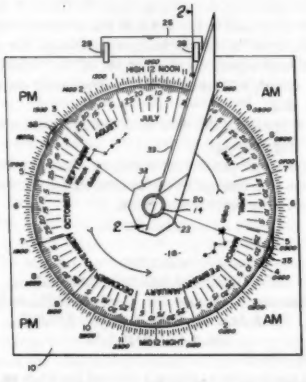
METHOD OF AND APPARATUS FOR TELLING TIME AT NIGHT

Olin E. Liddell, 1166 Sunnyvale-Saratoga Rd., #36, Sunnyvale, Calif. 94087

Filed Nov. 22, 1982, Ser. No. 443,582

Int. Cl.³ G01C *17/34*

U.S. Cl. 33—269 **24 Claims**



1. A device for telling time by reference to circumpolar stars comprising a base having a flat surface, means providing a circular time scale on said surface, a circular disc overlying said surface, means providing on said disc a calender scale in the form of indicia indicating the days of an entire year disposed in circular formation adjacent the graduations of the circular time scale, means mounting said disc for rotation about an axis relative to said base, a pointer overlying said disc, means mounting said pointer for rotation about said axis, means releasably attaching said pointer to said disc for rotary movement at times with said disc and at other times relative to said disc, and means providing a sighting aperture extending through said base at the axis of rotation of said pointer and said disc.

4,512,086

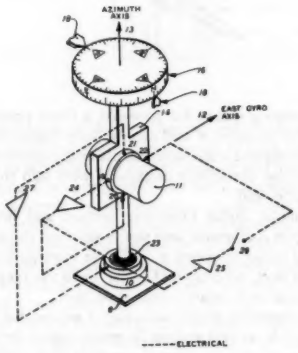
HEADING INDICATOR

George Galuschak, Hasbrouck Hts., and Richard J. Stomber, Wayne, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Continuation-in-part of Ser. No. 66,702, Aug. 15, 1979,. This application Feb. 9, 1982, Ser. No. 347,139

Int. Cl.³ G01C *19/34*

U.S. Cl. 33—324 **5 Claims**



1. A heading indicator comprising:

a case;

a single-degree-of-freedom platform supported by said case, for rotation about a vertical axis;

torquing means for rotating said platform about said vertical axis;

a two-degree-of-freedom, tuned-rotor gyroscope, with a first and second sensitive axes providing first and second outputs proportional to rotation about said two sensitive axes, having first and second torquing inputs for restoring rotation about said first and second axes, disposed on said platform, with said second sensitive axis aligned with said vertical axis;

first means for coupling the first output to said first torquing input;

second means for coupling said second output of said gyroscope to said means for torquing; and

third means for selectively coupling said first output to said second torquing input.

4,512,087

NAVIGATIONAL AID DEVICE

Lars O. Jerhammar, Brâddgatan 1Y, 60222 Norrköping, Sweden

Filed Jan. 13, 1984, Ser. No. 570,346

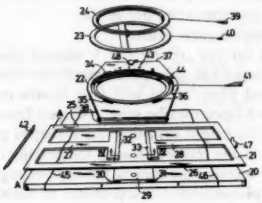
Int. Cl.³ B43L *5/00*

U.S. Cl. 33—431 **20 Claims**

1. A navigational aid device of the type comprising a disc supporting a map, especially a chart, a protractor being mov-

able over said map, a first carrier movable in the longitudinal direction of said disc, and a second carrier which is movable on said first carrier and in the transversal direction of said disc and upon which said protractor is rotatably journalled, wherein:

said first carrier consists of at least one ruler extending across said disc and situated upon said map;



sliding means situated between said map and said disc and connected to said at least one ruler, track means provided on and extending longitudinally of said disc, said sliding means being provided with at least one guide member movable along said track means for preventing transversal displacement of said first carrier; and

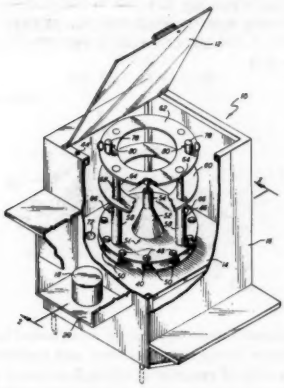
said second carrier including at least two scales to take deviation from the true North into consideration.

4,512,088

CENTRIFUGAL EXTRACTOR FOR ROTARY AIR FILTERS

Millard F. Clapper, R.D. 3 Box 291 Terrace Dr., Binghamton, N.Y. 13901

Filed Apr. 4, 1983, Ser. No. 481,728
Int. Cl.³ F26B *11/08*
U.S. Cl. 34—58 **10 Claims**



1. Centrifugal extractor apparatus for removing fluid from rotary air filter units following washing thereof, said apparatus comprising, in combination:

(a) an enclosed housing having a lid movable between open and closed positions;

(b) a drive motor mounted outside said housing;

(c) rotatable means within said housing adapted to support in an axially vertical orientation a rotary filter unit, said filter unit having outer and inner cylindrical walls, said outer wall having a predetermined maximum diameter, for rotation thereof to extract fluids by centrifugal force, said rotatable means including:

(i) a base member;

(ii) a first annular ring having predetermined inner and outer diameters, said inner diameter being slightly larger than said maximum diameter;

(iii) first support means fixedly supporting said first ring in spaced, parallel relation to said base member;

(iv) a second annular ring of substantially the same inner and outer diameters as said first ring;

(v) second support means adjustably supporting said second ring for axial movement in superposed relation to said first ring;

(vi) means for releasably fixing the position of said second ring with respect to said first ring; and

(vii) a central support member extending upwardly from an anchored position below said first ring, coaxially therewith, and having at least an upper portion of a diameter not greater than that of said inner cylindrical wall; and

(d) means for transmitting rotation from said motor to said rotatable means.

4,512,089

WINTER BOOT

Anthony Carrier, 25 Edmunds Dr., Toronto, Ontario, Canada M4N 2P7

Continuation of Ser. No. 415,535, Sep. 7, 1982, abandoned. This application May 14, 1984, Ser. No. 610,923
Int. Cl.³ A43B *3/30*
U.S. Cl. 36—112 **2 Claims**

1. A boot having a waterproof foot portion enclosing the foot of the user and having a leg portion fixed to the top of the foot portion and extending therefrom up the leg of the user, the leg portion comprising:

(a) a water repellant flexible material shaped to surround the leg of the user and having opposed first and second upright edges at first and second sides of the leg portion, which edges extend continuously from the top of the foot portion to the top of the leg portion;

(b) first and second elongated strips of adhesive material operative to adhere to one-another when pressed into mutual contact, the first and second strips being of substantial width and being attached in mutually opposed relationship at said first and second upright edges and both extending continuously therealong from the top of the foot portion to the top of the

(c) a V-shaped gusset joined to said first side of the leg portion at said first upright edge and extending beyond the first adhesive strip toward the second side of the leg portion and being joined thereto inside the leg portion along an upright seam which is spaced inwardly of said second side from said second upright edge by a distance which is at least as great as the width of said second adhesive strip, the seam extending from the top of the foot portion to the top of the leg portion and defining between it and the second edge an elongated flap which is coextensive with said second edge and which supports said second adhesive strip; and

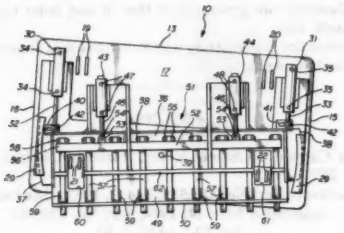
(d) the gusset being folded over upon itself against the leg of the user and the second adhesive strip inside the flap being overlapped and adhered to the first adhesive strip at the first edge of the leg portion, the overlap being variable to vary the closed circumference of the portion to achive a tight fit around the leg of the user.

4,512,090

EXCAVATOR BUCKET WITH RETRACTABLE SCRAPER AND SCARIFIER

Jeff Billings, Rte. #2, Box 4035, Shepherd, Tex. 77371

Filed Nov. 25, 1983, Ser. No. 555,122
Int. Cl.³ E02F 3/76
U.S. Cl. 37—117.5 **14 Claims**



1. An excavator bucket for attachment to earth moving vehicles comprising

a bucket having spaced parallel side walls, an open front, and a curved, outwardly convex rear wall having a cutting edge at said open front,

a curved, rearwardly facing scraper member mounted on said bucket rear wall for pivotal movement relative thereto,

a retractable scarifier assembly carried by said scraper member and vertically movable relative thereto, and

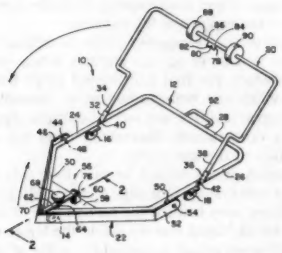
means for controlling vertical movement of said scarifier assembly.

4,512,091

SNOW PLOW SCOOP

Glenn Leininger, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Jan. 19, 1983, Ser. No. 459,363
Int. Cl.³ E01H 5/02
U.S. Cl. 37—278 **3 Claims**



1. A wheeled snow plow which comprises:

(a) a tubular frame having a laterally spaced pair of side portions, a rear portion and a V-shaped front portion;

(b) three wheel assemblies, one wheel assembly mounted to the bottom center of the V-shaped front portion and each of the other two wheel assemblies mounted to the bottom center of a respective side portion of the frame;

(c) a U-shaped handle with a free end and a pivotal end;

(d) means for connecting said pivotal end pivotally to the top center of the side portions of the frame so that the U-shaped handle will sit at a vertical angle with respect to the frame when it is in use and will pivot forwardly beyond said front portion of said frame when pivoted to a closed position when not in use;

(e) a V-shaped plow blade;

(f) means for connecting the V-shaped snow plow blade pivotally to the side portions of the frame so that the V-shaped plow blade will face frontwardly, be spaced from and circumscribe said V-shaped front portion;

(g) means for height adjusting the V-shaped plow blade with respect to the frame allowing for passage over rough and uneven terrain; the means for connecting the U-shaped handle pivotally to the top center of the side portions of the frame comprises:

(h) a pair of hinge stop members each hinge stop member affixed to the free end of the U-shaped handle, and

(i) a pair of pivot pins each pivot pin placed through one of the hinge stop members and one of the side portions of the frame; the means for connecting the V-shaped plow blade pivotally to the side portions of the frame comprises:

(j) a pair of spacers, each spacer having an aperture placed between one end of the V-shaped plow blade and the side of the front end of one of the side portions of the frame; and

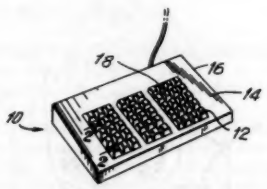
(k) a pair of pivot pins, each pivot pin placed through one end of the V-shaped plow blade, the aperture of the spacer and into the front end of one of the side portions of the frame.

4,512,092

REPLACEMENT LABELS FOR KEYBOARD

Thomas F. McLaughlin, Chappaqua, and Gerard J. Diaz, Hastings on Hudson, both of N.Y., assignors to Technical Support Services, Inc., Ossining, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,524
Int. Cl.³ A44C 3/00
U.S. Cl. 40—2 R **8 Claims**

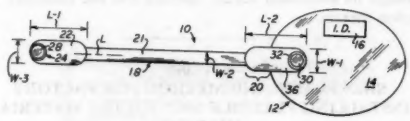


1. Replacement labels for keys of a keyboard having fitted clear plastic caps fitting over said keys, said replacement labels comprising a strip of material of a length to cover at least two aligned adjacent ones of said keys, said strip of material comprising folds transverse to the direction of alignment of said adjacent keys, said folds being aligned with said keys to be fitted on and conform to the shape of said keys to fit within said fitted caps when said fitted caps are placed on said keys, the width of said strip being substantially equal to the corresponding width of said keys, said strip comprising a material which retains said folds, the length of said strip of material between adjacent keys including at least one of said folds and being greater than the vertical movement of said keys such that at least said one fold in said strip comprises hinge means enabling one key to be depressed independent of the adjacent key without tearing said strip.

4,512,093
INTEGRAL TAG AND TIE

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B & G Plastics, Inc., New York, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,481
Int. Cl.³ G09F 3/08
U.S. Cl. 40—20 R 5 Claims

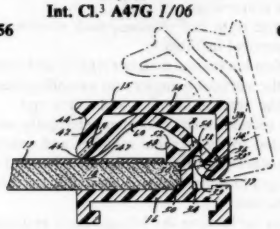


1. A tag comprising a unitary body having a tag body part and a flexible elongate tag tie having a first end extending from one end of said tag body part, said tag tie defining a latch projection extending normal thereto at a second end of said tag tie distal from said first end thereof, said tag body part having a latch opening adjacent said one end thereof and extending normal to said tag tie and of dimensions adapted to receive said latch projection, said tag body part further defining a channel, opening into exterior surface of said tag body part, and extending longitudinally with said tag tie from said one end of said tag body part commencing at said tag tie first end into registry with said opening, said channel being configured in complementary manner with a portion of said tag tie adjacent said latch projection, whereby said tag tie portion is adapted for nesting residence in said channel upon insertion of said projection into said latch opening.

4,512,094
PLASTIC POSTER FRAME WITH ARTICULATED BIAS MEMBER

James R. Seely, Rochester, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 448,047, Dec. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 424,883, Sep. 27, 1982, abandoned. This application Jun. 6, 1983, Ser. No. 499,441
Int. Cl.³ A47G 1/06
U.S. Cl. 40—156 66 Claims

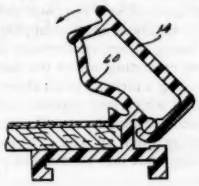


1. A closure comprising:
a first member,
a second member rotatable about an axis and movable with respect to said first member between relatively open and relatively closed positions, and
resilient articulated biasing means integrally attached to both said first member and said second member for connecting them together,
said resilient articulated biasing means including at least one living hinge means at a position between the integral points of attachment to said first member and said second member,
said first member and said second member defining a longitudinal dimension parallel to said axis and said biasing means being fully coextensive with said longitudinal dimension and said biasing means being substantially enclosed by said first and second members when disposed in said closed position,
said first member, said second member and said biasing means being made of extruded plastic material and being integrally formed together at the time of extrusion,
said first and second members comprising relatively rigid material and said biasing means comprising a relatively softer material and being elastic and resilient,
said biasing means providing a force urging said second member toward said closed position.

4,512,095
HINGED PLASTIC BIASED POSTER FRAME

James R. Seely, Rochester, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 448,047, Dec. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 424,883, Sep. 27, 1982,. This application Mar. 23, 1984, Ser. No. 592,904
Int. Cl.³ A47G 1/06
U.S. Cl. 40—156 70 Claims



1. A display holder having a plurality of elongated frame sections forming a polygonal frame structure for receiving and clamping a display piece in said display holder, the improvement comprising
each frame section having a base member, a moveable cover member, and resilient biasing means, said cover member having holding means for being positioned against said display piece and holding it in place,
said biasing means integrally attached to said base member and said cover member and connecting them together,
first living hinge means connecting one edge of said biasing means to said cover member, second living hinge means connecting a second edge of said biasing means to said base member,
said base member, cover member and biasing means being made of an extruded plastic material and being integrally formed together at the time of extrusion,
said base member and cover member comprising a relatively rigid material and said biasing means comprising a relatively softer material and being elastic and resilient,
said biasing means providing a spring-type biasing force holding said holding means of said cover member against said display piece.

4,512,096
ANIMAL IDENTIFICATION BAND AND METHOD AND MEANS FOR PERMANENTLY FASTENING SAME

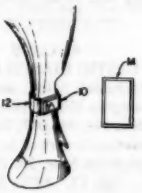
Robert F. Heidecker, Bozeman, Mont., assignor to Dairy Systems, Inc., Longmont, Colo.

Filed Oct. 19, 1981, Ser. No. 312,857
Int. Cl.³ G09F 3/00
U.S. Cl. 40—304 10 Claims

1. An identification device comprising in combination:
an elongated flexible strap, opposite ends of which are composed of a heat-fusible material;
identification circuit housing means releasably secured to

strap, said housing means including a hollow casing in the form of a generally rectangular pod and support means in the form of wire loop members on either side of said casing for securing said casing to said strap in superimposed relation;

temporary securing means defined by complementary fastening members at said opposite ends of said strap operative to temporarily secure said opposite ends in overlapping relation to one another whereby to establish the effective circumference of said strap as a preliminary to permanent fastening of said opposite ends together; and



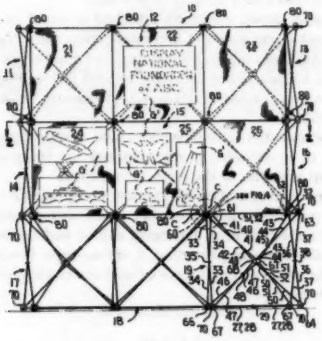
fusing means disposed on one of said opposite ends between confronting surfaces of said opposite ends when said opposite ends are arranged in overlapping relation to one another, said fusing means comprising an electrical conductive element extending across the substantial width of said one end having a melting point above the fusion point of said material of which said opposite ends are composed, said fusing means responsive to the generation of heat above the melting point of said heat-fusible material to fuse said opposite ends into permanently bonded relation to one another.

4,512,097

DISPLAY PANEL MOUNTING CLIP

Theodore R. Zeigler, 9923 Indian Queen Point Rd., Oxon Hill, Md. 20022

Filed Jul. 30, 1982, Ser. No. 403,363
Int. Cl.³ G09F *7/02*
U.S. Cl. 40—611 **45 Claims**



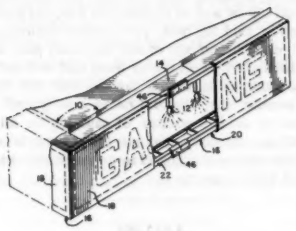
42. A collapsible self-locking portable display stand comprising a plurality of sections each formed from a plurality of pairs of crossed rods with said rods being pivotally connected to associated hubs, said hubs in the erected condition of said display stand setting-off corners of said sections, and points of attachment for a plurality of display panels, a plurality of display panels, a display panel mounting clip for mounting a plurality of corners of a plurality of the display panels to one of said hubs, each hub having an opening, each display panel corner having an opening, said display panel mounting clip including a clip body having a central body portion and four arms defining generally equal angles therebetween, a post projecting from said central body portion and being received in one of said hub openings, said post having means for preventing the inadvertent removal of said post from said one hub opening, a sleeve slidably carried by each arm, a hook-like projection carried by each sleeve received in an associated display panel corner opening, and means connected to said sleeves for exerting a tensioning force on each display panel through its associated corner opening and the hook-like projection therein.

4,512,098

SIGN FRAME AND METHOD FOR FACTORY INSTALLING FLEXIBLE SIGN FACING MATERIAL THEREON

Robert J. Ready, Cincinnati, Ohio; Donald E. Whipple, Edgewood, Ky., and James P. Sferra, Pleasant Plain, Ohio, assignors to Lighting Systems Inc., Cincinnati, Ohio

Filed Nov. 21, 1983, Ser. No. 553,719
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—610 **20 Claims**



1. Sign frame whereby flexible sign facing material composed of flexible film can be installed away from the job site on said frame in the manufacture of fascias having a longitudinal dimension exceeding 12 feet to provide an assembly which can be collapsed to reduce only the longitudinal dimension for transportation and restored to full length at the job site, said sign frame comprising

(a) left and right end sections, each section comprising

(i) a vertical member,

(ii) a first horizontal member rigidly and fixedly connected to the vertical member and extending between one end of the vertical member and a free end,

(iii) a second horizontal member rigidly and fixedly connected to the vertical member and extending between the other end of the vertical member and a free end, and

(iv) rigid bracing means connecting the horizontal members, and

(b) means for locking the left and right end sections in alignment, said locking means comprising means slidable on a horizontal member to partly encompass the free end of an adjacent horizontal member.

4,512,099

GUN LOCKING DEVICE

Ronald G. Mathew, 11763 Willow Valley Rd., Nevada City, Calif. 95959

Filed Feb. 24, 1984, Ser. No. 583,521
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—1 LP **7 Claims**

1. A device for locking a gun having a barrel with rifling extending from the muzzle to the throat, said device comprising:

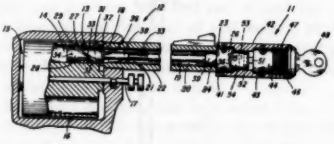
a. a tube insertable in the barrel and extending from the muzzle to the throat;

b. a rod translatable wihin said tube, the after end of said rod

extending into the gun chamber to prevent the operation of the gun;

c. a first wedge mounted on said after end of said rod, said wedge having a forwardly facing inclined surface;

d. a second wedge encompassing said rod and located between said first wedge and the after end of said tube, said second wedge having a rearwardly facing inclined surface for engagement with said forwardly facing inclined surface of said first wedge as said rod and said first wedge are urged in a forward direction, said first and said second wedges being thereby biased transversely so that at least one of said wedges is displaced far enough to interfere either with the walls of the throat or the base of the lands at the after end of the rifling; and,



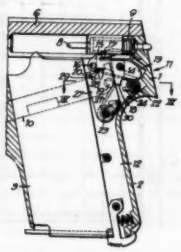
e. lock means for selectively translating said rod relative to said tube and urging said first wedge either toward or away from said second wedge.

4,512,100

POCKET PISTOL

Raymond J. Dheur, Cheratte, Belgium, assignor to Fabrique Nationale Herstal, Belgium

Continuation-in-part of Ser. No. 366,383, Apr. 7, 1982, abandoned. This application Dec. 8, 1983, Ser. No. 559,002
Claims priority, application Belgium, Aug. 28, 1981, 2/59319
Int. Cl.³ F41C *17/00*
U.S. Cl. 42—70 A **2 Claims**



2. A pocket pistol comprising:

(a) a body including a housing for receiving a cartridge magazine;

(b) a striker;

(c) A sear mounted for pivotal movement on the body for controlling the movement of the striker, the sear including a lateral finger and a downwardly extending protrusion;

(d) a trigger;

(e) a trigger rod having one end coupled with the trigger and the other end including a lug continuously engaging the downwardly extending protrusion;

(f) a first pin carried by the body;

(g) a first safety member mounted for pivotal movement on the first pin;

(h) means facing the downwardly extending protrusion for bringing the first safety member into and out of the trajectory of the protrusion to, respectively, prohibit and permit movement of the sear;

(i) a second pin carried by the body;

(j) a second safety member having one end mounted for pivotal movement on the second pin and another end disposed adjacent the lateral finger, the other end including a smaller cut-out portion and a larger cut-out portion;

(k) a first spring for continuously urging the second safety member into a first position wherein the smaller cut-out portion is disposed below the lateral finger when the housing is empty, thereby prohibiting movement of the sear when either the housing is empty or during insertion of the magazine into the housing, and into a second position wherein the larger cut-out portion is disposed below the lateral finger when a cartridge magazine is fully inserted in the housing, thereby permitting movement of the sear; and

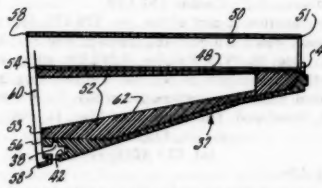
(l) a second spring engaging the lateral finger and the lug for maintaining the sear and the trigger in a rest position, the second spring being mounted around the first and second pins.

4,512,101

RIFLE BUTTSTOCK ASSEMBLY

Harold J. Waterman, Jr., Wallingford, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Oct. 19, 1983, Ser. No. 543,342
Int. Cl.³ F41C *23/00, 21/18*
U.S. Cl. 42—71 R **3 Claims**



1. In a buttstock for a rifle having a tubular lower receiver extension which buttstock is of the type having: a hollow shell of plastic material having a generally triangular shape with an oval-shaped cross-section which progressively increases in area in the longitudinal direction from the front end to the butt end of the buttstock, an inner core of different plastic material and a cylindrical volume defined in the buttstock for receiving the receiver extension, the improvement comprising:

an interior web of generally semi-circular cross-section integral with and forming a part of the shell, the web extending longitudinally such that the concave surface of the web defines the cylindrical volume together with the inner periphery of the upper portion of the shell.

4,512,102

ANIMAL AND INSECT EXTERMINATOR

Stanley E. Long, 52 Edna, Pontiac, Mich. 48053

Filed Aug. 9, 1982, Ser. No. 406,292
Int. Cl.³ A01M *27/00*
U.S. Cl. 43—84 **5 Claims**

1. An animal and insect exterminator comprising:

a tubular member having first and second ends;

a shatterable tip member replaceably mounted on the second end of the tubular member;

an explosive charge disposed within the tip member; and

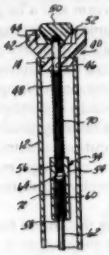
primer means mounted within the tip member within proximity with the explosive charge;

manually operable trigger means, carried by the first end of the tubular member and extending telescopically outward therefrom;

an elongated rod slidably disposed within the tubular mem-

ber forceably engaging the primer means upon urging of the manually operable trigger means;

first means for biasingly positioning the elongated rod away from the primer means; and



second means for biasingly urging the trigger means toward the elongated rod, the second biasing means extending a force opposed to and greater than the force exerted by the first biasing means.

4,512,103

METHOD FOR PRODUCING FUNGI

T. Lionel Coulthard, R.R. #2, Ganges, B.C., Canada V0S 1E0; Phillip M. Townsley, 4569 W. 13th Ave., Vancouver B.C., Canada V6R 2V5, and Hugh S. Saben, 819 W. 20th Ave., Vancouver, B.C., Canada V52 1Y3

Continuation-in-part of Ser. No. 279,475, Jul. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 104,763, Dec. 18, 1979, Pat. No. 4,292,328, which is a continuation-in-part of Ser. No. 935,141, Aug. 21, 1978, abandoned, which is a continuation of Ser. No. 679,994, Apr. 26, 1976, abandoned. This application Mar. 14, 1983, Ser. No. 475,064

Int. Cl.³ A01G *1/04*

U.S. Cl. 47—1.1 **9 Claims**

1. A method for producing fungi comprising the steps of:

providing a relatively inert support medium for physically supporting fungi growth,

contacting said support medium with a liquid nutrient comprising the product of thermophilic, aerobic digestion of biodegradable organic material to provide a growing bed,

inoculating the liquid nutrient with spawn without sterilization of said liquid nutrient,

maintaining the liquid nutrient in said growing bed at a predetermined temperature and moisture content to promote the growth of mycelia.

4,512,104

APPARATUS FOR HARVESTING MAPLE TREE SAP

Robert M. Lamb, Box 368, Rte. 49, Bernhards Bay, N.Y. 13028

Filed Dec. 19, 1983, Ser. No. 563,056

Int. Cl.³ A01G *23/00*

U.S. Cl. 47—52 **3 Claims**

1. In a sap gathering system of the type wherein a main sap collecting line is positioned below bore holes in a plurality of trees so that sap from the trees can flow by gravity from the bore holes into the collecting line, said system including a tap for insertion into a bore hole, said tap having a housing containing an enclosed chamber, a hollow spout outwardly disposed from the housing having an open end that is insertable within the bore hole so that sap flows from the hole into the chamber, a first downwardly disposed flow connector depending from the housing and a second upwardly disposed flow connector in the collecting line, a vertically disposed drop line mounted in fluid flow communication between the two connectors whereby sap flowing into the chamber passes by gravity into the collecting line, an upraised bracket in the top of the housing having a hole for removably containing a spout plug, said plug having an elongated tapered body that fits in sealing engagement within the open end of the spout to close the spout when the tap is removed from the bore hole, hanger means secured to the tree above said collecting line for engaging the

hole in said bracket to suspend the tap in a stored position above the collecting line when said spout is removed from the bore hole and sealed with said plug whereby the drop line is hung in a vertical position above the collecting line, and a flexible strap attaching the plug to the tap.

4,512,105

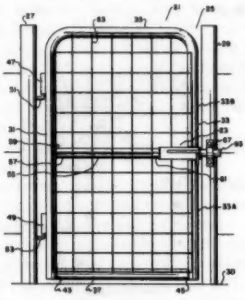
GATE LATCH

Dennis J. Norton, 7558 Carriage La., Fort Worth, Tex. 76112

Filed Feb. 6, 1984, Ser. No. 577,192

Int. Cl.³ E05B *65/06*; E05C *5/02, 1/04*

U.S. Cl. 49—394 **6 Claims**



1. A gate, comprising:

a generally rectangular shaped frame comprising two side frame members, an upper frame member, and a lower frame member,

one of said side frame members being used to support hinge means for pivotally coupling said frame to a structural means such that said frame may swing to open and closed positions relative to another structural means,

a hollow elongated member having first and second aligned openings formed through first and second opposite ends respectively,

said hollow elongated member at said first end being connected to said other side frame member such that said second end of said hollow elongated member extends toward said one side frame member,

an intermediate hollow frame member having an open end located in said second opening of said hollow elongated

member and an opposite end connected to said one side frame member,

an elongated bolt means located in said hollow elongated member,

said bolt means having a first end extending through said first opening and a second end extending through said second opening and into said open end of said intermediate hollow frame member,

said elongated bolt means being movable between a fastening position and an unfastening position,

in said fastening position, said first end of said bolt means extends beyond said first end of said hollow elongated member a given distance for insertion into an opening formed in the other structural means for fastening said frame to the other structural means,

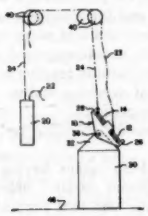
in said unfastening position, said bolt means being located closer to said one side frame member than in said fastening position such that said first end of said bolt means can be withdrawn from the opening formed in the other structural means for unfastening said frame from the structural means.

4,512,106

CABLE FAILURE INDICATOR

John N. Roche, Greenville, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 30, 1983, Ser. No. 567,236
Int. Cl.³ E05D *13/10*
U.S. Cl. 49—445 **4 Claims**



1. In a system for assisting the vertical movement of a closure wherein a counterweight for balancing the closure is suspended from each of two cables in a redundant cable system, a device for indicating the failure of one or more of the cables comprising:

a member having two arms for so connecting each of the cables to the counterweight that the counterweight is maintained at a first distance from the closure when all cables are intact and the counterweight so moves to a second distance from the closure when at least one of the cables fails that the counterweight can move into a position for inhibiting the raising of the closure, thereby indicating the failure of one of the cables, said second distance being greater than said first distance;

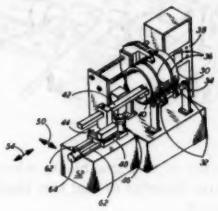
each of said arms being adapted for sliding attachment to one of the cables; said member being so pivotally connected to the counterweight that the cables maintain said arms in such a generally horizontal position when both cables are intact, that the counterweight is maintained at said first distance, and one of the cables so slides along the one of said arms to which it is attached when the other of the cables fails, that said member pivots, moving said arms toward such a generally vertical position that the counterweight moves to said second distance.

4,512,107

AUTOMATED POLISHER FOR CYLINDRICAL SURFACES

Robert A. Jones, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 16, 1982, Ser. No. 441,987
Int. Cl.³ B24B *5/40*
U.S. Cl. 51—56 R **8 Claims**



1. An apparatus for either precision polishing or grinding the inner sutface of a cylindrical workpiece comprising, in combination:

means to support a cylindrical workpiece;

first drive means coupled to said support means to rotate said workpiece about its longitudinal axis at an adjustable speed;

an elongated arm with a free end, said arm being mounted for movement in a direction parallel to said longitudinal axis and disposed to project into the area surrounded by said workpiece;

a pad support means to urge a pad supported thereby against the inner surface of said workpiece, said pad support means being coupled to said free end of said arm;

means to move said pad in a repeating motion relative to said workpiece;

second drive means to move said arm relative to said workpiece at an adjustable speed;

first detector means to detect the position of said free end of said arm;

second detector means to detect the rotary position of said workpiece relative to said support means;

means responsive to said first detector means and said second detector means to adjust the speed of said first drive means and said second drive means in accordance with a predefined speed for said first and said second drive means as a function of the rotary position of said workpiece and the position of the free end of said arm.

4,512,108

LENS WORKING APPARATUS

Takahide Kobayashi, Kawasaki, Japan, assignor to Koken Co., Ltd., Japan

Filed Sep. 13, 1982, Ser. No. 417,575
Claims priority, application Japan, Apr. 16, 1982, 57-64497
Int. Cl.³ B24B *7/00*
U.S. Cl. 51—101 LG **6 Claims**

1. A lens working apparatus, comprising:

a rotary grindstone having a driven shaft;

an X-Y slidable lens blank carrier having a pair of lens blank holding shafts disposed parallel to the shaft of said rotary grindstone, said shafts holding between them a lens blank to be rotatably worked by said grindstone to form a circumferential rib on said lens blank;

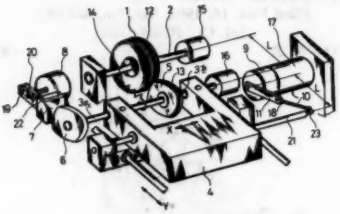
a lens model fixedly mounted on one of said lens blank holding shafts to be rotated thereby in fixed relation to rotation of said lens blank;

a model partner urged against said lens model;

a sensor for detecting a defined contact angle of said lens model with said model partner;

a controller operably associated with said sensor; and

a slider-crank mechanism, operated by an output of said controller, for shifting said X-Y slidable lens blank carrier



in an axial direction of said lens blank, whereby the circumferential rib on the edge of said lens blank is thereby controllably formed.

4,512,109

ROLLING GEAR APPARATUS FOR AN INVOLUTE TOOTH GEAR CUTTING MACHINE

Heinrich van de Löcht, Malsch, Fed. Rep. of Germany, assignor to BHS-Dr. Ing Hofler, Maschinenbau GmbH, Ettlingen-Oberweier, Fed. Rep. of Germany

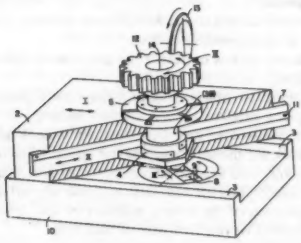
PCT No. PCT/DE82/00138, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982

PCT Filed Jul. 5, 1982, Ser. No. 432,922

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126768

Int. Cl.³ B24B *3/00*

U.S. Cl. 51—123 G **12 Claims**



1. A rolling-gear apparatus for an involute-tooth gear cutting machine, the machine including an engine bed, comprising:

a primary carriage longitudinally movable in both directions along a movable path I in a first guideway formed on the engine bed;

a secondary carriage longitudinally movable in both directions along a movement path II in a second guideway formed on the primary carriage, the movement path II being at an oblique angle relative to the path I;

a crank element connected to the secondary carriage and glidingly movable in a third guideway, the third guideway being angularly adjustable relative to the engine bed;

a roll-circle member carried by the primary carriage and connected to a working-part table for co-rotation therewith, the roll-circle member being rotatably connected to the secondary carriage through a band-drive; and

drive means connected to at least one of the primary carriage, the secondary carriage and the working-part table for driving the same in their respective translational and rotational movements.

4,512,110

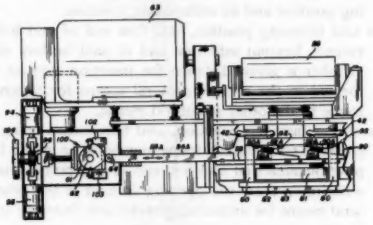
ENDLESS ABRASIVE BELTS

Lee E. Stump, Brooklyn Park, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 329,245, Dec. 10, 1981, abandoned. This application Jan. 11, 1984, Ser. No. 569,971

Int. Cl.³ B24B *21/08*

U.S. Cl. 51—141 **7 Claims**



1. Apparatus for controlling the working force and relative disposition of the work-contacting surface of a driven endless abrasive belt while in contact with the surface of a workpiece held within a working station, said apparatus comprising, in combination:

(a) drive means for establishing a predetermined orbital working path for an endless abrasive belt and wherein said working path includes a zone for arranging abrading contact between said abrasive belt and a workpiece held within a working station;

(b) a first frame means disposed in spaced relationship to said drive means and including at least one working station;

(c) work retaining means for positioning a workpiece within said working station and for arranging abrading contact between said workpiece and said abrasive belt; and

(d) means for adjustably positioning said endless abrasive belt in a planar parallel fashion relative to the surface of a workpiece within said working station, said adjustable positioning means comprising:

(1) second frame means for retaining said adjustable positioning means;

(2) abrasive belt back-up means having a first support plate mounted in planar parallel fashion relative to a second support plate, said first support plate movable along a first axis and said second support plate movable along a second axis and a third support plate coupled to said first support plate via at least one extendable guide-posts and movable along said first axis;

(3) at least one inflatable airbag coupled to said first support plate for applying a predetermined normal bias along said first axis to said first support plate in and toward said workpiece;

(4) a rigid linear cam means coupled intermediate said first and second support plates and movable along said second axis and comprising at least one pair of complementary mating inclined relatively movable ramps for movably positioning said third support plate along said first axis in a predetermined spaced relationship relative to said working station so as to bring said work-contacting surface into a substantially parallel orientation relative to the workpiece in said working station;

(5) rotating cam means coupled to said linear cam means for generating reciprocatory to-and-fro movement between said mating inclined ramps along said second axis and thereby controlling the extent of movement and ultimate position of said abrasive belt back-up means along said first axis relative to said abrasive belt during each machine cycle; and

(6) said rotating cam means comprises a rotating adjustment sleeve coupled to a cam drive shaft and which cam drive shaft is, in turn, coupled to a slidable shaft housing and said rotating cam means, and wherein a

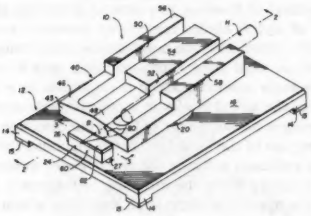
means for correctively repositioning said back-up means and abrasive belt relative to a workpiece to accommodate belt wear comprises first and second controlled air cylinders diametrically mounted in opposed relation to each other and tangent to said adjustment sleeve for incrementally rotating said sleeve and thereby laterally correcting said housing on said cam drive shaft and correspondingly retracting or advancing said rotating cam means coupled to said linear cam means.

4,512,111

KNIFE BLADE SHARPENER

Don A. Childers, 11259 Casa St., Ventura, Calif. 93004

Filed Oct. 26, 1982, Ser. No. 436,731
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—157 **10 Claims**



1. A device for shaping and sharpening the blade of a utility knife or the like, comprising:

(a) a base member having a flat top surface and a second flat surface disposed parallel and below the top surface,

(b) a sharpening stone firmly mounted on the base member and having a flat sharpening surface parallel to the flat top surface of the base member,

(c) the base member having a large circular opening in its flat top surface aligned with and spaced a predetermined distance fron the sharpening stone,

(d) a slider unit consisting of a block positioned in sliding engagement with the base member including a slider base disposed below the top surface and in general alignment with the circular opening so as to slide parallel with the top surface, the slider base having a planar surface of larger area than the circular opening and in close sliding engagement with the second flat surface such that the slider unit has firm, fixed planar movement, and including base engaging means for holding the slider unit in sliding engagement,

(e) a slider head disposed above the top plate which is supported on the slider base and connected thereto by a cylindrical support post on the slider unit being of substantially smaller diameter than the circular opening in the top surface and extending through the circular opening to freely permit two degrees of substantial planar translational movement of the slider unit with respect to the sharpening stone, and

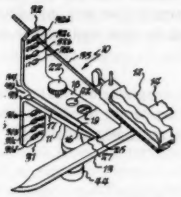
(f) a saddle unit being connected through a pivotal connection to the slider base head which permits movement along an axis parallel to the plane of translation of the slider unit and also having a knife receiving upper surface for supporting the knife blade transversely with respect to the sharpening stone flat surface and bringing it into contact therewith at an acute fixed angle, such that a flush wiping contact of the edge of the knife blade is made with the upper surface of the sharpening stone.

4,512,112

KNIFE SHARPENER CLAMP CONSTRUCTION

Arthur L. LeVine, P.O. Box 800, Williamsville, N.Y. 14221

Filed Oct. 4, 1982, Ser. No. 432,702
The portion of the term of this patent subsequent to Sep. 18, 1984, has been disclaimed.
Int. Cl.³ B24B *3/54*; B21K *5/12*; B25B *3/00*
U.S. Cl. 51—221 BS **9 Claims**



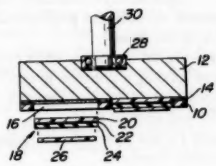
1. A sharpener clamp construction comprising first and second clamp members having a first longitudinal axis and first and second ends, respectively, first and second jaws at said first ends of said first and second clamp members, respectively, for clamping a knife with a second longitudinal axis extending transversely to said first longitudinal axis, first and second guide member means of substantially the same width as said clamp members formed integrally as an extrusion with and extending outwardly from said first and second clamp members, respectively, at said second end, a plurality of apertures in said first and second guide member means at different distances from said second end for receiving a guide rod attached to a sharpener stone holder, first and second opposite sides on said first and second clamp members, respectively, first and second bores in said first and second opposite sides, respectively, a post, and a pin at the end of said post, said pin being of a size to fit snugly within said first and second bores, whereby said first clamp member may be mounted on said post and thereafter said second clamp member may be mounted on said post after said sharpener body has been inverted relative to said post.

4,512,113

WORKPIECE HOLDER FOR POLISHING OPERATION

William D. Budinger, 16 Southridge Rd., Kennett Square, Pa. 19348

Filed Sep. 23, 1982, Ser. No. 422,124
Int. Cl.³ B24B *4/04*
U.S. Cl. 51—236 **7 Claims**



1. A workpiece holder for polishing, lapping and grinding operations comprising a carrier adapted to be mounted for rotation, a flat template secured to a face of the carrier and having a plurality of holes therethrough, each hole cooperating with said carrier face to define a discrete cavity, an insert removably retained in each cavity, each insert comprised of a volume compressible fixturing material having a low compression set value and a low compressive modulus that will allow it to compress under a service load to at least 10 percent but not more than 60 percent of its potential range of compressibility, the fixturing material being adapted to be releasably attached to a major face of a workpiece, the fixturing material being

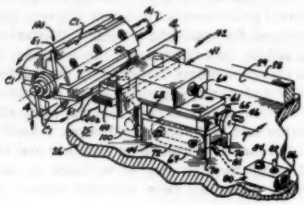
secured to the carrier by a thermoplastic resin, the resin being initially placed within each cavity with the cavity at a temperature sufficient to cause the resin to melt, the volume compressible fixturing material then being placed in each cavity over which is then pressed a blank with geometry the same as that desired from the finished workpiece, the fixturing material with the blank then being compressed at a reduced temperature, causing the melted resin first to flow and form a seat to compensate for irregularities and imperfections in the fixturing material, and then to cool and harden in said compensated condition.

4,512,114

METHOD FOR HIGH TOOTH EQUALIZATION OF CUTTERS

Clarence M. Theien, Rockford, Ill., assignor to Superior Machinery Inc., Rockford, Ill.

Filed Sep. 27, 1982, Ser. No. 423,653
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—288 **21 Claims**



1. The method of "jointing" a plurality of cutter elements carried by, and spaced circumferentially about the axis of, a rotationally power-driven spindle in a machine tool, said machine tool having a magnetically permeable member formed with a planar workpiece support surface which lies either parallel or normal to the spindle axis,

said method comprising, in combination

(1) locking an abrasive stone in the carrier of a fixture which comprises a magnetically permeable base and a carrier linearly movable to different positions along a predefined path relative to the base,

said stone having an operative edge projecting from said carrier and having a contour generally conforming to the contour of said cutter elements along a direction parallel to said spindle axis,

(2) placing said fixture base on said support surface with freedom to slide thereon,

(3) while said spindle is not rotating, slidably shifting said fixture base relative to said support surface to locate the stone's operative edge in juxtaposed general alinement with the cutting edge of at least one of said cutter elements,

(4) creating magnetic flux to releasably lock said fixture base to said support surface by magnetic force attraction,

(5) power driving said spindle at a speed within its normal range of working speeds, and

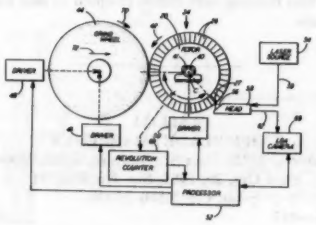
(6) infeeding said carrier along said path relative to said base and toward said cutter elements until said stone makes the cutting edges of all cutter elements travel in a common surface of revolution concentric about said spindle axis.

4,512,115

METHOD FOR CYLINDRICAL GRINDING TURBINE ENGINE ROTOR ASSEMBLIES

Robert J. Miller, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 7, 1983, Ser. No. 501,983
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—289 R **14 Claims**



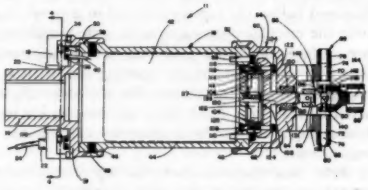
1. The method of finishing to a desired dimension the tips of a plurality of airfoil blades removably mounted around the periphery of a rotor disk, the combination comprising a rotor assembly of an axial flow turbo-machine, which comprises rotating the rotor assembly about a rotor axis in a direction which moves the airfoil blades in a concave side direction so that air impinges on the blades in the same direction as it impinges during use of the axial flow turbo-machine, the rotating speed being sufficient to cause the rotor blades to move air in substantial quantity along the direction of said rotor axis; and contacting the tips of the blades with a medium which removes material therefrom.

4,512,116

FEED-UP MEANS FOR EXPANDABLE WORK ENGAGING MEMBERS

Frank E. Vanderwal, Jr., Frontenac, and James K. Davis, Cedar Hill, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Jun. 8, 1983, Ser. No. 502,146
Int. Cl.³ B24B *33/02*
U.S. Cl. 51—347 **37 Claims**



1. A rotary drive train for a radially expandable tool comprising:

a machine tool, rotatable about an axis which is substantially coaxial with the rotational axis of the drive train connected thereto including a body having a longitudinal bore therethrough and at least two angularly related transverse bores intersecting the longitudinal bore at an intermediate location therealong, an adjustment member positioned in the longitudinal bore substantially on the rotational axis of the machine tool, at least two opposed work engaging assemblies having means extendible into selected ones of the transverse bores for engaging the adjustment member whereby movements of the adjustment member in the longitudinal bore produces radial movement of the work engaging assemblies,

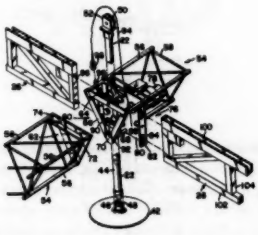
a non-rotatable structure,
said rotary drive train including a rotatable drive operatively connected to the machine tool and rotatable relative to the non-rotatable structure to rotate the machine tool, said rotatable drive including a rotatable motor housing,
a feed motor, having a motor shaft mounted in the motor housing substantially on the rotational axis of the drive train and rotatable therewith and means to supply electric energy to the feed motor including slideably engageable first and second contact means positioned respectively on the rotatable drive train and on the non-rotatable structure, and
means operatively connecting the motor shaft to the adjustment member.

4,512,117

MODULAR PROSCENIUM THEATRE

Fredric A. Lange, Osseo, Minn., assignor to Interlock Structures International, Inc., Minneapolis, Minn.

Filed Aug. 6, 1982, Ser. No. 405,990
Int. Cl.³ E04H *3/10*
U.S. Cl. 52—6 **26 Claims**



1. A theatre comprising:
a movable curtain for separating acting space from nonacting space;
a light for illuminating said acting space;
overhead frame means for supporting said curtain and said light, said frame means including a plurality of modular sections and first means for disconnectably attaching adjacent said sections together, said attaching means including an element attached to one of each adjacent pair of sections and a cradle for receiving said element attached to a second of said adjacent pair, said cradle having spaced apart side walls and a back wall whereby said element is received between said side walls to contact said back, said modular sections and said attaching means providing for enlarging and reducing frame means size;
mean for supporting said frame means above the acting space; and
means for disconnectably connecting said supporting means and said frame means;
whereby said theatre is readily expandable and portable.

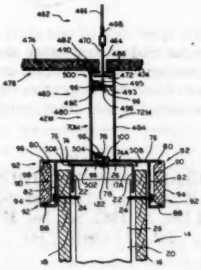
4,512,118

CASING ARRANGEMENT FOR PARTITION END CAPS

Robert R. Rasmussen, 1120 Grandview La., Lake Forest, Ill. 60045

Division of Ser. No. 277,226, Jun. 25, 1981, Pat. No. 4,443,984. This application Nov. 25, 1983, Ser. No. 554,964
Int. Cl.³ G09F *7/18*
U.S. Cl. 52—39 **3 Claims**

1. For use in forming partitioning in a building structure to define, in the area to be subdivided by the partitioning, room space between a floor and a ceiling, with the ceiling being of the suspended T grid type, a casing arrangement for forming partition end caps,
said casing arrangement comprising a pair of cooperating frame members,
said casing frame members comprising:
first and second elongated plates each defining a web portion extending longitudinally thereof and having the partition upper end defining side of the respective plates on one side surfacing thereof and the other side surfacing of the respective plates being the partition masking side of same,
said plate web portions each having first and second marginal edge portions extending longitudinally of the respective plates along either side edging of said plate web portions,
said plates along said first marginal edge portions thereof on said partition masking side of the respective plates each defining a lateral wing flange extending normally longitudinally thereof set back from the terminal edging of said first marginal edge portions respectively, and having along its projecting edge a stub flange paralleling said web portion and terminating in a terminal edging,
said first marginal edge portion, and wing flange, and said



stub flange of said plates defining a channel shaped recess extending longitudinally of said plates, respectively,
means for snap fit mounting a trim piece in said recesses, respectively, for masking same,
said plates along said second marginal edge portion of said web portion being generally flat for partition overlying purposes,
with said plates being juxtaposed in overlapping relation and said wing flanges being disposed on either side of the partition,
and means for supporting said frame members from a common T grid support member,
said support means comprising:
each of said plates defining an upright flange portion each having a suspension flange at right angles thereto, with said suspension flanges being disposed in spaced apart opposed relation to receive and rest on the T grid support member along either side of the T grid support member,
and including snap action locking means interacting between the respective upright flanges together along the T grid support member.

4,512,119

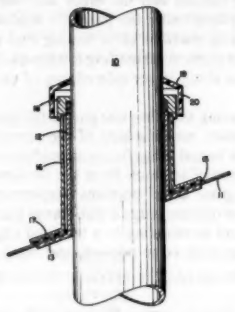
APPARATUS FOR ROOF FLASHING

John C. Willoughby, Victoria, Australia, assignor to Foam-Lag Industries Pty. Ltd. and P.C.H. Constructions Pty. Ltd., both of Victoria, Australia

Filed Aug. 12, 1983, Ser. No. 522,743
Claims priority, application Australia, Aug. 13, 1982, PF5379; Sep. 24, 1982, PF6050
Int. Cl.³ E04D *13/14*
U.S. Cl. 52—58 **12 Claims**

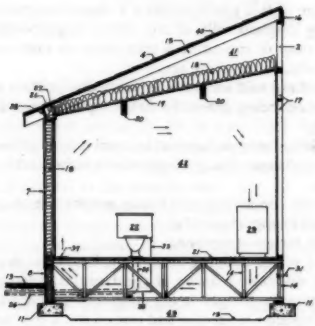
1. Apparatus for flashing roofs around pipes using a relatively thin sheet of material engageable about said pipe to form part of the roof, said sheet being provided, in use, with a hole

through which said pipe passes; said apparatus including an inner sleeve member fitting over said pipe and passing through said hole and having an annular flange engaging the underside of said sheet, an outer sleeve member fitting over said inner sleeve member, said outer sleeve member having an annular



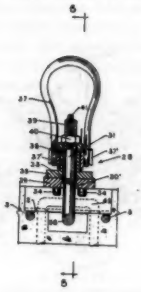
flange engaging the upper side of said sheet and a locking cap attached to an upper end of said inner sleeve member in a manner engaging and applying a force on an upper end of said outer sleeve so as to force said respective flanges toward each other in a manner clamping said sheet therebetween.

4,512,120
MODULAR HOME CONSTRUCTION
Sir W. Lindal, 1120 8th Ave., #1702, Seattle, Wash. 98101
Filed Feb. 24, 1982, Ser. No. 351,944
Int. Cl.³ E04B *1/343*
U.S. Cl. 52—79.1 **8 Claims**



1. A transportable modular house having its foundation attached; said foundation is a sheathed 3-dimension box truss, braced longitudinally and crosswise with vertical trusses and also diagonally to form a rigid flat bottomed base for the house itself during transportation that prevents the walls, partitions and ceiling of the house from racking during transportation; said box truss foundation also serves the transportable modular home as a cavity for the placement of plumbing, heating, air conditioner, hot water storage tank and necessary piping, ducting and electric wiring, and which also serves as storage space; said box truss foundation is constructed of decay resisting material so that it can be permanently set into the ground deep enough for its flat bottom to be below the frost line for the intended geographical location of the house and be resistant to insect attack and decay while set in the earth; the bottom plane of said box truss foundation is rigid and flat so that the modular house can be set and fixed on a truck or trailer, whose flat bed is narrower and shorter than the modular house, enabling the transportation of the modular house without the overhanging box truss bending or breaking during transportation over rough roads.

4,512,121
HANDLING SYSTEM FOR PRECAST UNITS
Roger Carydias, 331 Demers St., Sainte-Rose, Laval, Province of Quebec, Canada (H7L 3C3), and Chahan Pacradouni, 2320 Captain Bernier, Montreal, Canada H3M 1W5
Filed May 24, 1983, Ser. No. 497,607
Int. Cl.³ E04G *21/12*; E04C *5/16*
U.S. Cl. 52—125.2 **5 Claims**



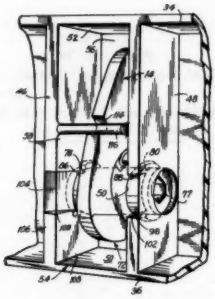
1. In a handling system for a moldable element, such as a reinforced precast concrete panel, beam or the like, said element including a cavity formed therein adjacent an exposed surface of said element, said cavity communicating with the exterior at said exposed surface by a restricted slot, said cavity having a length at least equal to the length of said slot and a width greater than the width of said slot, said slot and cavity adapted to receive an anchor member having a main straight shank and a transverse leg at one end, the cross-sectional maximum dimension of said anchor member being smaller than the width of said slot and the length of said transverse leg being greater than the width of said slot and smaller than the width of said cavity, whereby said transverse leg can enter said cavity when oriented longitudinally of said slot, rotation of said anchoring member, about the axis of said main leg through a rotated position about a quarter turn, causing said transverse leg to extend in said cavity transversely to said slot and, therefore, secure said anchoring ember to said element, a base plate having a central hole through which the main leg of said anchor member rotatably extends, said base plase having an underface adapted to be applied flat against said exposed surface of said element over said restricted slot, safety pins fixed to said plate on each side of said central hole and protruding from its underface to engage said slot and prevent rotation of said base plate, a guiding support fixed to said base plate opposite said safety pins to rotatably guide said anchor member, said central hole having a lateral notch and said main leg of said anchor member having a laterally-extending lug to engage said notch to prevent rotation of said anchor member with respect to said base plate and guiding support, the outer end portion of said main leg of said anchor member being threaded and further including a nut screwed on said threaded portion and engaging said guiding support.

4,512,122

PANEL FASTENER SYSTEM

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Industries Inc., Binghamton, N.Y.

Filed May 3, 1982, Ser. No. 373,907
Int. Cl.[3] E04G *23/00*
U.S. Cl. 52—127.9 7 Claims



1. An improved fastener system for insulated slab panels, the fastener being of the type having the first housing mounting a hook assembly and a second housing mounting a pin, the first and second housings being locked together via the hook assembly and pin, the hook assembly including a cam, a hook extending from the cam, and opposed extended hubs mounted transversely from the cam, said system in combination, comprising;

walls disposed in said first housing forming a slot therein for receiving said hook member and for positioning said hook member for attachment to said pin of said second housing,

means defining a recess disposed in each of said walls, said recess for receiving said hubs of said hook assembly for pivotable mounting,

an inclined plane disposed in each of said walls for spreading out said wall means into a biased position when said hubs are moved along said walls towards said recess means, said walls being movable from said biased position to an unbiased position after said hubs have moved along said inclined planes to said recess means, whereby said hubs are positively captured in said recess means, and said hook assembly is resiliently locked within said first housing for rotatable movement therein, and

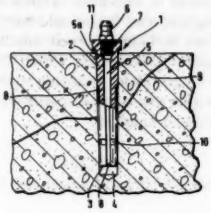
biasing means disposed between said hook and said cam for providing positive contact therebetween, said first housing having an upright front wall facing said second housing, said wall including a pair of upright opposing walls spaced one from another to form said slot, said slot being disposed substantially vertically in said front wall, said recesses including a pair of annular bearing receptacles adapted to receive said hubs, said receptacles being disposed on opposite sides of said slot closely spaced to an inner surface of said front wall, said annular bearing receptacles including opposed hub receiving apertures formed in said opposing walls, and wherein said annular bearing receptacles further including a pair of opposed support members extending from the inner surfaces of said opposing walls, said support members forming hub receiving apertures coextensive with said annular bearing receptacles, said support members forming hub passages adapted to receive said hubs as said hubs are moved along said inclined.

4,512,123

HIGH-PRESSURE PACKING DEVICE FOR INJECTING SYNTHETIC RESIN INTO CRACKS IN CONCRETE

Artur Fischer, Weinhalde 34, D-7244 Tumlingen/Waldachtal 3, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,616
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203871
Int. Cl.[3] E02D *5/18*
U.S. Cl. 52—173 R 2 Claims



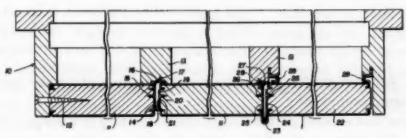
1. A high-pressure packing device for injecting hardenable synthetic resin into cracks in concrete and insertable into a hole drilled in concrete in the region of a crack, comprising an elongated sleeve of synthetic plastic material having an axis and an internal bore, a front end to be positioned near a base of said hole and a rear end, said sleeve having an outer surface tapering towards said front end whereby said sleeve is wedged in said hole; and an injection nipple inserted into said bore at said rear end of the sleeve, said sleeve being formed with a plurality of longitudinal guiding grooves formed in said outer surface and starting immediately from said front end and extended in the direction of the axis of said sleeve, said guiding grooves being spaced from each other in a circumferential direction, said sleeve being further formed with at least one additional circumferential groove formed in said outer surface and extended between two said adjacent grooves to connect the longitudinal grooves to each other, whereby the synthetic resin injected through said niple into said bore flows into said base and then is guided along said longitudinal and circumferential grooves and rises towards the crack to seal the crack when hardened.

4,512,124

RIGIDIFIED DOORWAY

Dennis W. Banford, Evans, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Aug. 2, 1983, Ser. No. 519,505
Int. Cl.[3] E06B *1/04*
U.S. Cl. 52—207 2 Claims



1. A doorway structure comprising a doorway frame including spaced vertical stiles, at least a pair of fixed doorway panels within said doorway frame and a horizontally swingable door within said frame on one side of one fixed panel, the fixed panels and said door occupying a common vertical plane when the door is closed and there being narrow vertical spaces between the fixed panels and between the door and the adjacent fixed panel, vertical edge portions of the fixed panels and door overlapping forward faces of said stiles, vertically spaced hinges for said door including pairs of hinge leaves fixed to

opposing vertical edges of the door and said one fixed panel and being disposed within one of said narrow vertical spaces, the hinges including vertically extending pins and knuckles disposed immediately forwardly of the last-named narrow vertical space, and interlocking connectors for the fixed panels within the narrow vertical spaces between the fixed panels, said connectors being disposed at the heights of said hinges and corresponding in number to said hinges and having the same vertical lengths as said hinges to simulate the appearance of said hinges to an observer of the front of the doorway structure, said connectors including opposing bracket plates and tongue plates fixed to opposing vertical edges of the fixed panels and being disposed within said narrow vertical spaces, the bracket plates including curved simulated hinge knuckle elements on their forward ends within the narrow vertical spaces, and the tongue plates including angled tongues on their forward ends within said vertical spaces which are interlocked within said simulated knuckles.

4,512,125

ELEMENTS FOR SUPPORTING AND BRACING SEALED-GLAZING UNITS

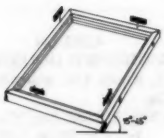
Lars E. Eriksson, Storgatan 40, S-361 00 Emmaboda, Sweden, and Göte Rickardsson, Gislaved, Sweden, assignors to Lars Erik Eriksson, Sweden

PCT No. PCT/SE82/00253, § 371 Date Mar. 28, 1984, § 102(e) Date Mar. 28, 1984, PCT Pub. No. WO84/00574, PCT Pub. Date Feb. 16, 1984

PCT Filed Jul. 30, 1982, Ser. No. 598,317

Int. Cl.³ E06B 7/14

U.S. Cl. 52—209 **15 Claims**



1. An element for supporting and bracing a plate-like unit in a frame, comprising:

first and second parallel edge ribs extending in a longitudinal direction, each of the edge ribs having a first longitudinally extending side for being mounted against a plate-like unit and a second longitudinally extending side opposite the first side for being mounted against a frame, the first and second sides of each edge rib being spaced apart by a rib thickness, the edge ribs being spaced apart from each other in a transverse direction generally perpendicular both to the longitudinal direction and the rib thickness;

a central part between the first and second edge ribs for connecting the edge ribs to each other; and

a loop member extending generally in the transverse direction between the first and second edge ribs, the loop member being movable in the direction of rib thickness between a first position in which the loop member extends beyond one of the first and second sides of the first and second edge ribs and a second position in which the loop member is jammed between the plate-like unit and the frame for holding the element in position while the plate-like unit is mounted in the frame.

4,512,126

PANEL MODULE MEANS

Everett V. Walston, Indianapolis, Ind., assignor to Beaver Products, Inc., Noblesville, Ind.

Filed Dec. 28, 1981, Ser. No. 334,530

Int. Cl.³ E04B 1/04

U.S. Cl. 52—251 **5 Claims**

1. A panel module for a building, the panel module having a concrete face panel and a backing of insulation, the insulation being provided by spaced bodies of insulation, ribs of concrete being provided in the spaces between the insulation bodies, reinforcing bars being provided in the spaces between the insulation bodies, and held by the concrete poured thereinto to provide said ribs;

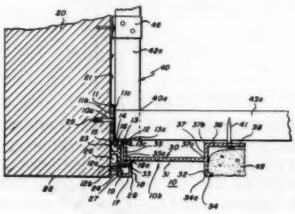
in a combination in which at least one of the reinforcing bars carries a connector member for use in connecting the panel module associated components of the building to the floor of the building, the connector member being a loop-like hook having leg means extending in a direction such that the axis of the leg means is generally perpendicular to the axis of the reinforcing bar, and with a portion of the leg means formed to underlie the reinforcing bar on a side opposite the connector member, thus providing means by which the panel module may be anchored to the floor of the building and any force component exerted on the connector member in the direction of the axis of its leg means is transmitted compressively to the reinforcing bar,

the connector member extending into the region of the edge of the building's concrete floor, thereby providing means for securely anchoring the panel module to the floor of the building.

4,512,127
MOLDINGS

Julian J. Attaway, Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed May 5, 1983, Ser. No. 492,020
Int. Cl.³ E04F *13/06*
U.S. Cl. 52—288 **20 Claims**



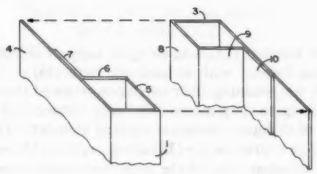
1. A plural shaft molding adapted to be associated with sub-structure of a building and be facially opposed by first and second structural bodies, at least said second structural body being of a dry wall or of a fluent settable coating type, and said molding comprising first and second molding shafts, said first molding shaft including, a first wall portion adapted to be fastened to said building, and second and third wall portions, said third wall portion being joined at a first end thereof to a first end of said first wall portion so that a rearward face of said third wall portion forms a corner in said first molding shaft with an inside face of said first wall portion, and said second wall portion having a first end joined to said third wall portion and said second wall portion laterally leading forwardly angularly disposed relatively to said third wall portion outside said first molding shaft corner, for said sub-structure to be disposed in part inside said corner with said first wall portion fastened to said building and said first structural body facially to be continuous to outside faces of said first and second wall portions and to a recessed reveal to be introduced by said first and second molding shafts; said second molding shaft including, a side wall having an outside face to be concealed by said second structural body contiguous to said reveal, and a lead and contact wall connected at an inner end thereof to a first end of said side wall and adapted to be fastened to said sub-structure; and said first and second molding shafts further including, a back wall and lapping portion connected with either one of said side wall of said second molding shaft and said second wall portion of said first molding shaft intermediately of said first end and a second end of said one of said side wall of said second molding shaft and said second wall portion of said first molding shaft, and a supplemental flange wall connected with the other of said second wall portion of said first molding shaft and said side wall of said second molding shaft, for said supplemental flange wall and said back wall and lapping portion to be between an inside face of said second wall portion of said first molding shaft and an inside face of said side wall of said second molding shaft and said first and second molding shafts to introduce said reveal having said back wall and lapping portion contribute facially in said recess to said reveal, and said back wall and lapping portion to lap said supplemental flange wall proximately thereto and proximately to said inside face of said other of said second wall portion of said first molding shaft and said side wall of said second molding shaft, having said back wall and lapping portion for lapping and said supplemental flange wall relatively movable with reference to one another laterally in first and second directions and longitudinally in a third direction, while having said sub-structure in part inside said corner in said first molding shaft, said first wall portion of said first molding shaft fastened to said building, and said first structural body contiguous to said outside faces of said first and second wall portions of said first molding shaft and to said reveal, with said lead and contact wall of said second molding shaft meanwhile fastened to said sub-structure, and said outside face of said side wall of said second molding shaft concealed by said second structural body contiguous to said reveal.

4,512,128
Patent Not Issued For This Number

4,512,129
ELECTROSTUD

John F. Riggs, P.O. Box 648, Stone Mountain, Ga. 30086

Filed Jul. 12, 1982, Ser. No. 371,565
Int. Cl.³ E04F *17/00*
U.S. Cl. 52—364 **3 Claims**



1. An electrostud said stud being formed from two sheets of metal each capable of receiving self-driving sheetrock screws, each said metal sheet having at least 3 right angle bends in a first direction dividing that sheet into three sheet segments, the first sheet segment being the width of a standard stud and forming a side of the electrostud, the second sheet segment forming a nailing surface for the electrostud, the third sheet segment forming an attachment surface for joining the said two sheets of metal back-to-back and having a width substantially less than half the width of the first segment but greater than the length of a standard self-driving sheet rock screw, and the fourth sheet segment having a width equal to the distance between the first and third segments to enclose a screw receiving compartment, said two sheets of metal being joined back-to-back to form an electrostud having two screw receiving compartments and an intermediate electrical compartment.

4,512,130
INSULATION SUPPORT

Jean P. Pepin, Civic Center Dr., Augusta, Me. 04330

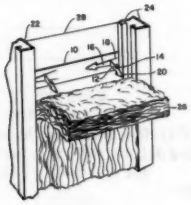
Filed Mar. 22, 1982, Ser. No. 360,220
Int. Cl.³ F04B *1/74*
U.S. Cl. 52—404 **5 Claims**

1. An improved building insulation system comprising fiber insulation (26) and improved apparatus for supporting and

retaining said fiber insulation (26) on a wall, ceiling, partition or other structure surface (28) of a building wherein the improved apparatus comprises:

elongate strap means (10) constructed and arranged with a flat bearing face portion for bearing and fastening against a structure surface of a building;

a plurality of elongate insulation support members (12) formed in the strap means (10) each insulation support member (12) having a free end (20) and a stem end (18) merging with the strap means (10) and being formed with sufficient length from the stem end to the free end to match the thickness of the fiber insulation (26) to be supported and retained, each said insulation support member (12) constructed and arranged to be manually foldable at the stem end by installation workers to extend at an angle from the strap means (10) for supporting and retaining insulation, each said elongate support member being formed with a declining taper at the free end (20) for impaling and supporting fiber insulation (26) on the support member (12), said elongate support member (12) also being formed with at least one barb (14) at the free end (20) for retaining fiber insulation impaled thereon;



said elongate strap means (10) being formed with the plurality of elongate insulation support members (12) cut in the elongate strap means (10) along cutouts (16) in a row with the elongate axes of the insulation support members (12) and cutouts (16) parallel with the elongate axis of the strap means (10);

said elongate insulation support members (12) being initially formed generally in the same plane with the strap means (10) for installation of the strap means (10) on a structure surface (28) with the elongate insulation support members (12) lying in substantially the plane of the strap means (10) whereby installation workers may subsequently fold the elongate insulation support members at an angle projecting from the strap means (10) for support of insulation (26) upon installation of the insulation.

4,512,131

PLANK-TYPE BUILDING SYSTEM

Larry W. Laramore, 22526 108th SE. Ave., Kent, Wash. 98031

Filed Oct. 3, 1983, Ser. No. 538,133

Int. Cl.³ E04B 1/40

U.S. Cl. 52—586 **14 Claims**

1. A plank-type building system, comprising:

at least two planks, each plank having first and second opposing major surfaces, first and second side surfaces joining said major surfaces, and first and second end surfaces joining said major and said side surfaces, said first and said second side surfaces each having a longitudinal groove formed therein, said second major surface having a slot oriented transversely to said second major surface, said slot extending to said first and said second side surfaces and having a depth sufficient to intersect said longitudinal grooves therein, said slot being positioned proximate one

of said first and said second end surfaces for abutment with an underlying member of the building system;

a spline for engaging said longitudinal grooves of said planks when said planks are arranged with said first side surface of one plank in abutment with said second side surface of the other plank; and,

connecting means for engaging said slots of said planks and preventing longitudinal displacement thereof.

4,512,132

PORTABLE EARTH ANCHOR

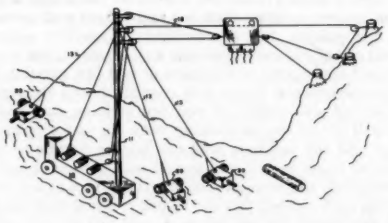
Kenneth C. Keesee, Smoot, and James A. Ruckman, Lewisburg, both of W. Va., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 268,774, Jun. 1, 1981, Pat. No. 4,406,100.

This application Jun. 3, 1983, Ser. No. 492,257

Int. Cl.³ E02D 5/74

U.S. Cl. 52—742 **1 Claim**



1. A method of stabilizing a portable mast comprising the steps of:

A. Providing a plurality of ground wheel supported, reinforced concrete anchor means having ground penetrating spike means projecting upwardly from top surfaces thereof;

B. Erecting said mast at a suitable, desired location;

C. Connecting one end of guy wires to and proximate of the top of said mast;

D. Rolling at least one of said anchor means to a desired anchor location respective to a guy wire;

E. Inverting said anchor means to sequentially disengage said support wheels from the support ground and engage said spike means with the support ground;

F. Setting said spike means to restrain guy wire tension forces; and,

G. Securing the other end of said guy wire to said anchor means.

4,512,133

DEVICE FOR STERILIZING A THERMOPLASTIC STRIP USED FOR THE HOT-FORMING OF STERILE CONTAINERS AND STERILE PACKAGING INSTALLATION USING THE DEVICE

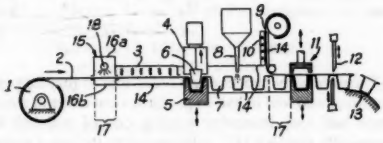
Roland Torterotot, Longvilliers, France, assignor to Pak Pro International, N.V., Willemstad, Netherlands Antilles

Division of Ser. No. 135,666, Mar. 31, 1980, Pat. No. 4,329,829. This application Feb. 12, 1982, Ser. No. 348,409

Claims priority, application France, Jan. 17, 1980, 80 01030

Int. Cl.³ B65B *55/08, 55/06*

U.S. Cl. 53—167 **10 Claims**



1. An installation for the sterile packaging of a sterile product in sealed packages, said installation comprising a reel of thermoplastic strip material, means to unwind said thermoplastic strip from said reel in a stepwise manner so as to extend along a feed path, a heating chamber positioned adjacent said feed path and including a plurality of heating elements for heating said thermoplastic strip to its softening temperature through the entire thickness of said strip, a hot-forming device including a movable mold and a punch engageable with said thermoplastic strip for producing container portions therein, a filling station for depositing a sterile product in said container portions, means for sterilizing a cover strip and means for guiding the sterilized cover strip onto said thermoplastic strip so that it overlies container portions in which sterile product has been deposited, sealing means for sealing said sterilized cover strip over said container portions, cutting means for severing said sealed container portions from said thermoplastic strip to provide discrete filled and sealed containers, discharge means for removing said discrete filled and sealed containers, enclosure means defining a first sterile, enclosure on both sides of said thermoplastic strip extending from said heating chamber to a location immediately upstream of the sealing means, a means for sterilizing the thermoplastic strip comprising a sterilizing heating device situated upstream of the heating chamber and further comprising a second sterile enclosure communicating with the first sterile enclosure of the heating chamber via a passage through which the thermoplastic strip extends, wherein the second sterile enclosure of said sterilizing means encloses said sterilizing heating device; said sterilizing heating device comprising a plurality of sterilizing heating resistors of the type having essentially instant thermal response for generating an instantaneous thermoplastic strip surface temperature which exceeds the softening temperature of said strip, an adjustable power source, a control circuit connecting said adjustable power source to said sterilizing heating resistors and switching means mounted in said control circuit for intermittently, operatively connecting said heat resistors to said power source for automatically, repetitively energizing said sterilizing heating resistors, with each said energization time period not exceeding five seconds.

4,512,134

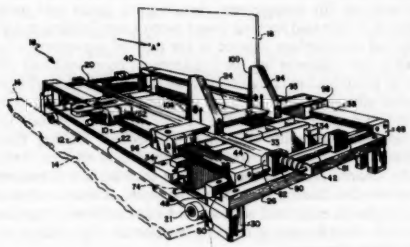
UNIVERSAL TYPE PACKING HEAD

Mary K. Robinson, Akron, and Timothy F. Probst, North Canton, both of Ohio, assignors to Figgie International, Willoughby, Ohio

Filed Nov. 9, 1982, Ser. No. 440,365

Int. Cl.³ B65B *21/16*

U.S. Cl. 53—248 **9 Claims**



1. In a packing head for a case packer apparatus or the like including a carrier frame,

a shifting frame operably positioned on said carrier frame for movement laterally thereof and including side bars and blade bars, said carrier frame being stationary in relation to said shifting frame,

a plurality of mounting blocks slidably carried by each of said blade bars,

means for securing said mounting blocks to said blade bars in fixed positions thereon, said mounting blocks normally being positioned in opposed pairs at upstream and downstream ends of said shifting frame, and

longitudinally extending skid blades positioned on and extending between said pairs of mounting blocks whereby lateral movement of said skid blades as a unit will occur with movement of said shifting frame but where the lat-

eral relation of the said skid blades to said stationary carrier frame can be varied.

4,512,135

LOCKING MECHANISM FOR WRAP-AROUND CARTONS

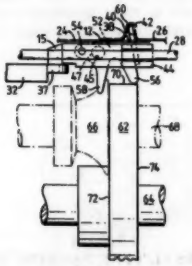
Dale K. Scott, Jonesboro, and Rodney K. Calvert, Dunwoody, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed May 12, 1983, Ser. No. 493,873

Claims priority, application United Kingdom, Jun. 12, 1982, 8217109

Int. Cl.³ B65B *7/24, 11/10*

U.S. Cl. 53—285 **4 Claims**



1. A locking mechanism for locking together overlapping base panels of a wrap-around carton, which mechanism includes carton conveying means, a locking element, and means pivotally mounting said locking element about a pivot axis on said conveying means for movement therewith, said locking element comprising a locking finger for insertion into said base panels to form a lock therebetween and a bifurcated portion providing a first cam follower leg and a second cam follower leg, a first cam surface located in the path of said first cam follower leg for engagement therewith to pivot said locking element so that said locking finger moves into locking position, a second cam surface located in the path of movement of said second cam follower leg for engagement therewith and effective to pivot said locking element so that said locking finger is moved into retracted position, said first and second cam surfaces being spaced apart in the path of movement of said locking element whereby said first and second locking fingers alternately engage said first and second cam surface, respectively, characterized in that said first cam surface comprises a rotatable disc having a constant diameter as measured across its peripheral edge and said second cam surface comprises a rotatable disc having a convex peripheral edge which is of decreasing diameter.

4,512,136

FITMENT ATTACHMENT METHODS IN HORIZONTAL FORM/FILL/SEAL MACHINES

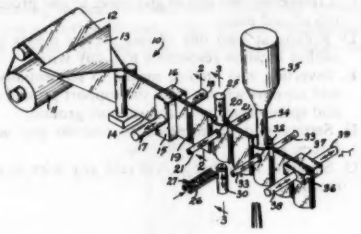
William C. Christine, Catasauqua, Pa., assignor to Trinity Associates, a Partnership of the State of Pennsylvania, Nazareth, Pa.

Filed Aug. 23, 1982, Ser. No. 410,591

Int. Cl.³ B65B *9/08, 61/00*

U.S. Cl. 53—410 **3 Claims**

1. A method of attaching fitments to a pouch of thermoplastic material in a horizontal form/fill/seal machine comprising the steps of: first folding a web of material substantially in half in a longitudinal direction with the fold being lowermost, and moving said material horizontally, next sealing said web vertically at spaced intervals to provide a plurality of pouches, at least partially slitting said seals with the slit extending upwardly from said fold, separating the opposite side walls of each pouch, moving a fitment against said lowermost fold surface of said pouch and causing said surface to flatten against said fitment, then applying a fitment sealing element against the flattened portion of said fold surface and heating at least one



fitment and said fold surface to cause intimate bonding therebetween, said slits permitting the portions of said pouch to move toward each other.

4,512,137

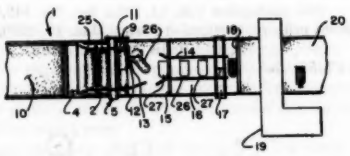
BREAD LOAF PROCESSING

Ross D. Koberlein, Brownstown, Ill., assignor to Bettendorf Stanford Inc., Salem, Ill.

Filed Sep. 2, 1982, Ser. No. 414,478

Int. Cl.³ B65B *25/18, 35/58, 63/00;* **A21C** *15/04*

U.S. Cl. 53—435 **7 Claims**



1. The process of processing a bread loaf or the like comprising splitting said loaf in half to produce a cut end and a heel end of each half loaf, thereafter turning one of said half loaves mechanically through 180° with respect to the other so that the heel and cut ends of both of the two half loaves are oriented in the same direction, cutting the two half loaves into slices, and packing said sliced half loaves in separate packages but in the same orientation with respect to each package.

4,512,138

FORM, FILL AND SEAL MACHINE WITH HOT GAS AND THERMAL IMPULSE SEALING

Eddie L. Greenawalt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 4, 1982, Ser. No. 354,589

Int. Cl.³ B65B *9/00*

U.S. Cl. 53—451 **16 Claims**

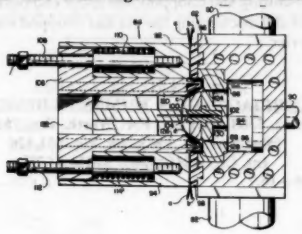
10. In a form, fill and seal machine for forming sealed packages of a product from a web of heat sealable material which is formed into a tube, and then the product is deposited in a measured amount in a closed end of the tube, an improved method of sealing the product in the tube comprising:

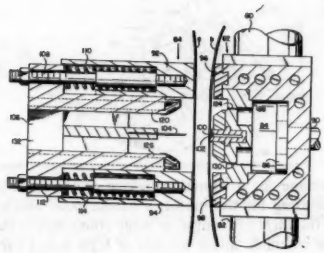
clamping the formed tube of heat sealable material at a station spaced along the tube from the closed end with the deposited product inbetween to press the tube walls together in a sealing area extending transversely of the tube;

applying heat and pressure to one side of the transverse sealing area by means of a hot gas directed onto the sealing area as a "free form" clamp; and

applying heat to the other side of the transverse sealing area

opposite the hot gas by means of an electrical heater to fuse the tube walls together and form a uniform seal





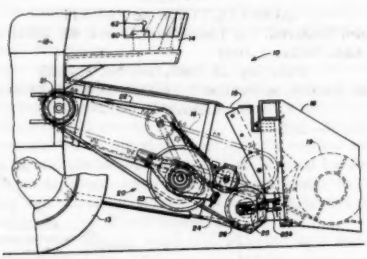
whereby the sealing area is pressed between said hot gas and said electrical heating means.

4,512,139

DRIVE REVERSER ACTUATING MECHANISM

Glenn A. Musser; James F. Rayfield, both of New Holland, and Richard A. Pucher, Leola, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Dec. 12, 1983, Ser. No. 560,671
Int. Cl.³ A01D *69/00*
U.S. Cl. 56—11.2 **11 Claims**



1. In a crop harvesting machine for harvesting crop material from a field, said crop harvesting machine having a mobile frame adapted for movement over the field; a header having harvesting means supported by said frame to gather crop material from the field and initiate a crop harvesting process; a source of rotational power mounted on said frame to power the operation of said header harvesting means; drive transfer means operatively interconnecting said source of rotational power and said header harvesting means to transfer rotational power for driving said header harvesting means, said source of rotational power being selectively disengageable by a clutching means to interrupt the driving of said header harvesting means by said source of rotational power; and drive reversing means operatively connected to said drive transfer means to reverse the direction of rotational power transferred to said header harvesting means to reverse the operation thereof, the improvement comprising:

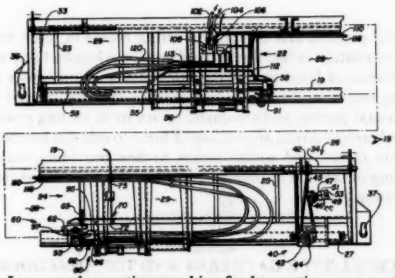
actuation means interconnecting said clutching means and said drive reversing means to prevent the operation of said drive reversing means to drive said header harvesting means while said drive transfer means is transferring operative power to said header harvesting means from said source of rotational power.

4,512,140

STUB DRAPER DRIVE FOR DRAPER HEADER

Edward A. Blakeslee, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 16, 1983, Ser. No. 532,945
Int. Cl.³ A01D *35/14, 57/20*
U.S. Cl. 56—11.6 **10 Claims**



1. In a crop harvesting machine for harvesting crop material from a field and having a mobile frame adapted for movement across the field; a generally transverse header subframe having laterally spaced ends forwardly mounted on said mobile frame; a reciprocating cutterbar forwardly mounted on said header subframe to sever standing crop material from the field and initiate the crop harvesting process, said cutterbar including first and second sickles reciprocatable in opposing directions to minimize vibrations in said subframe; drive means mounted on said header subframe to drive said first and second sickles from the respective ends of said header subframe; said drive means including first and second rotatable drive shafts extending toward the respective ends of said header subframe from a centrally located source of rotational power; and a laterally shiftable draper movably mounted on said header subframe rearwardly of said cutterbar for transverse movement relative to said subframe, said draper being rotatable to convey crop material in a lateral direction, the improvement comprising:

a stub draper affixed to said header subframe adjacent said second end, said stub draper being rotatable to convey crop material thereon laterally away from said second end toward said first end, said stub draper including a first rotatable drive member; and

a flexible member interconnecting a second drive member affixed to said second drive shaft and said first drive member to transfer rotational power from said second cutterbar drive shaft to said stub draper to effect rotation thereof simultaneously with the operation of said cutterbar.

4,512,141

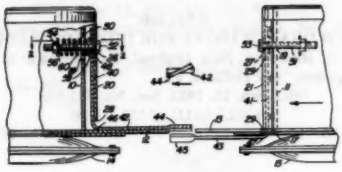
DRUM MOWERS HAVING SPRING MOUNTED FLAT BLADES

Bernard C. Mathews, deceased, late of Crystal Lake, Ill., and by Violet E. Mathews, administrator, 8606 Rte. 176, Crystal Lake, Ill. 60014

Filed Aug. 26, 1983, Ser. No. 526,689
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—13.6 **20 Claims**

1. In a drum mower comprising at least one generally vertically disposed rotatable drum, said drum having a larger diam-

eter generally horizontally disposed disc at its bottom, and said drum having a plurality of L-shaped blades, the vertical portion of each said blade attached in relation to said drum and the horizontal portion of each said blade positioned in close relation to one side of said disc and extending radially therebeyond, the improvement comprising: said L-shaped blades comprising a flat vertical portion and a flat horizontal portion, said flat vertical portion attached in relation to said drum by spring mounting means extending through an oversize hole in said flat



vertical portion, and comprising spring means in force transmitting relation to said flat vertical portion whereby horizontal application of force to said flat horizontal portion causes said spring means to flex providing arcuate yielding of said flat horizontal portion and automatic return to its cutting position and whereby vertical application of force to said flat horizontal portion causes said spring means to flex providing vertical yielding of said flat horizontal portion and automatic return to its cutting position.

4,512,142

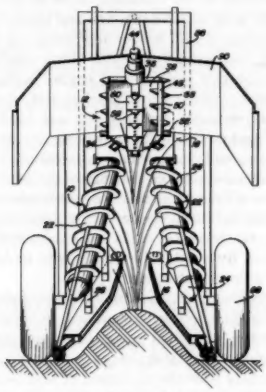
SCROLL-TYPE GATHERER AND TOP SHREDDER WITH LONGITUDINAL BLADES FOR SUGAR CANE HARVESTER

Walter J. Landry, P.O. Box 788, Jeanerette, La. 70544, and Robert T. André, P.O. Box 313, New Iberia, La. 70560

Continuation-in-part of Ser. No. 542,700, Oct. 17, 1983, abandoned. This application Nov. 16, 1983, Ser. No. 552,472

Int. Cl.[3] **A01D** *45/10*

U.S. Cl. 56—13.9 **16 Claims**



1. A sugar cane gathering and topping attachment for a sugar cane harvester comprising a pair of laterally spaced, upwardly and rearwardly inclined gathering means for engaging and lifting the leaves on the upper portion of the sugar cane stalks and guide the same rearwardly in relation to the sugar cane harvester, and a cutter means located at the rear end of said gathering means for cutting the non-millable upper end portion of the sugar cane stalk from the millable lower portion thereof and chopping the non-millable portion into small segments, said cutter means comprising a driven rotatable knife carrier, a plurality of vertically spaced horizontal knives mounted on said carrier for movement in spaced circular paths having a center coinciding with the rotational axis of the carrier and a plurality of longitudinal knives mounted on said carrier for cutting and chopping the upper end portion of sugar cane stalks and discharging the cut and chopped stalks laterally of the carrier.

4,512,143

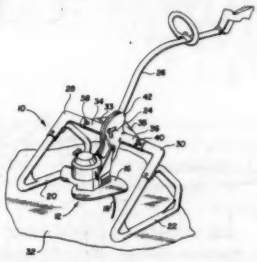
CARRIAGE FOR A TRIMMING DEVICE

Raul Jimenez, 5308 Jerri La., Fort Worth, Tex. 76117

Filed Nov. 14, 1983, Ser. No. 551,126

Int. Cl.[3] **A01G** *3/06;* **A01D** *53/00*

U.S. Cl. 56—16.7 **3 Claims**



1. A carriage for a trimming device of the type having a motor, a housing for the motor, a handle pole, and a cutting element in the form of a length of cable connected to the motor so as to be rotatable about an axis at high speed for cutting grass, weeds and the like comprising in combination:

at least two runners;

opposing grip members for gripping the handle pole, forming a channel for receiving the handle pole and two cross channels transverse to and on opposite sides of the channel for receiving the handle pole;

two tubes, one tube received by each of the cross channels;

means for securing the tubes in the cross channels; and

means for securing the ends of the tubes opposite the gripping means to the runners wherein the runners support the trimming device.

4,512,144

GRASS CUTTING APPARATUS

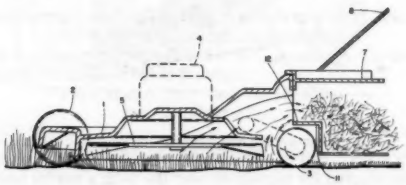
Teodoro Soldavini, Via Leonardo da Vinci, 48, 20062 Cassano D'Adda (Milano), Italy

Filed Sep. 23, 1983, Ser. No. 535,285

Claims priority, application Italy, Oct. 13, 1982, 23164/82[U]

Int. Cl.[3] **A01D** *35/22*

U.S. Cl. 56—202 **2 Claims**



1. An improved grass cutting apparatus, of the type including a blade rotating in a plane parallel to the ground, comprising a housing or casing, mounted at the front on wheels and at the rear on a roller, whereon an engine is mounted effective to drive said grass cutting blade and cause said grass cutting apparatus to advance on the ground, and provided with an inlet chamber for sucking the cut grass and conveying the latter to a collecting hopper connected to said casing, characterized in that the front portion of said collecting hopper is so designed as to be superimposed at least partially on said roller, in such a way as to provide a main path for the cut grass flow

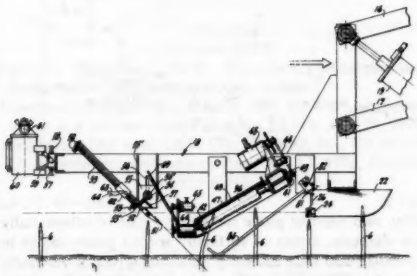
and prevent the cut grass from obstructing the outlet portion of said inlet chamber and characterized in that said roller is effective to operate as a baffle member for conveying the cut grass stream towards the inlet portion of said collecting hopper.

4,512,145

ASPARAGUS HARVESTER

William J. Lund, Stockton, Calif., assignor to Spear Harvesters, Stockton, Calif.

Filed Nov. 8, 1982, Ser. No. 440,138
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—327 A **7 Claims**



1. An asparagus harvester for use with asparagus spears growing in the ground and projecting upwardly therefrom in random array in a path of predetermined width comprising:

a. a main frame;

b. means for advancing said main frame on the ground along said path;

c. a sub-frame;

d. means for supporting said sub-frame on said main frame at selected heights above said ground;

e. a plurality of vertical divider plates disposed on said sub-frame in the leading portion thereof and in an array transversely of said sub-frame. each of said divider plates being substantially planar and defining a plurality of spaces therebetween;

f. means on said sub-frame trailing said divider plates for engaging and exerting a lifting force on the asparagus spears;

g. means on said sub-frame and movable with respect thereto for severing the asparagus spears below the ground and to retract therefrom;

h. height responsive means, each effective between respective pairs of said plates to actuate said severing means in response to the height of asparagus spears within a respective one of said spaces;

i. an opaque bar mounted to pivot about a vertical axis on one of said plates and adapted to be pivoted by contact with an asparagus spear in one of said spaces to rotate about said axis and to actuate said height responsive means in adjacent ones of said spaces; and,

j. a conveyor on said sub-frame adjacent said engaging means and said severing means for receiving and conveying away asparagus spears severed by said severing means.

4,512,146

CROP ENGAGING DEVICE

Wilfred E. Klinner, Milton Keynes, England, assignor to National Research De Development, London, England

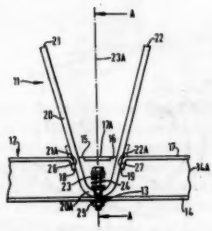
Filed Sep. 30, 1982, Ser. No. 430,594
Claims priority, application United Kingdom, Oct. 5, 1981, 8129970; Dec. 4, 1981, 8136651
Int. Cl.³ A01D *82/00*
U.S. Cl. 56—364 **20 Claims**

1. A crop engaging device comprising:

support means including a rotor and a plurality of channel-section support members secured to said rotor and aligned along the direction of the axis of rotation of the rotor, each channel-section support member having an inner flange closer to the axis of rotation and an outer flange further spaced from the axis of rotation, and a linking portion linking the two flanges,

a plurality of outwardly extending crop engaging elements secured to each one of said support members, each crop engaging element comprising an elongate member shaped as two outwardly extending arms which diverge from each other in the outward direction and in a plane generally transverse to the direction of movement of the arms relative to the crop, the elongate members being secured to the support members at the region of conjunction of the two arms,

a plurality of axial fastening means, each elongate member being secured to its support member by a single axial fastening means having a principal axis along which the



fastening means extends through a base portion of the associated elongate member at the said region of conjunction of the arms,

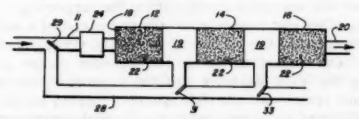
a plurality of guides formed on the support members for locating the arms of the crop engaging elements, each shaped elongate member being secured to the inner surface of the inner flange of said support member with the said conjunction of the arms of the elongate member within the channel-section, there being provided in said outer flange of said channel section at least one opening through which said arms of the element pass, said guides of said support members being provided by the sides of said at least one opening in said outer flange of said channel-section, the arms of each crop engaging element being yieldable in operation by movement of the arms relative to the support member by sliding movement along said guides.

4,512,147

METHOD AND APPARATUS FOR REMOVING CARBON PARTICLES FROM ENGINE EXHAUSTS

Victor W. Wong, Cambridge, Mass., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 7, 1983, Ser. No. 456,484
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—274 **2 Claims**



1. Apparatus for removal of particulates from exhaust gas emitted by an internal combustion engine which comprises a first gas flow conduit leading to the exhaust of an internal combustion engine and to a first particulate trapping chamber containing means for removing particulates from exhaust gas,

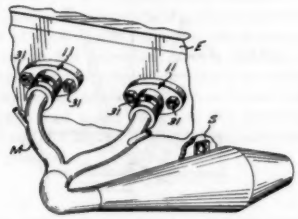
at least two additional particulate trapping chambers containing means for removing particulates from exhaust gas, gas mixing chambers disposed between each of the said particulate trapping chambers, means for heating gas flowing in said first gas flow conduit at a location upstream of said first particulate trapping chamber, a second gas flow conduit connecting with said first gas flow conduit at a location upstream of said heating means and leading to said gas mixing chambers, and low diretting means for selectively directing flow through said first and second gas flow conduits.

4,512,148

INTERFACE FOR WATER COOLED ENGINE MANIFOLDS

Clayton J. Jacobson, P.O. Box 5338, Empire Landing RB, Parker, Ariz. 85344

Filed Jul. 5, 1983, Ser. No. 510,766
Int. Cl.³ F01N *7/06, 7/18*
U.S. Cl. 60—321 **4 Claims**



1. In an internal combustion engine provided with exhaust ports for venting the products of combustion and a hollow jacket for containing coolant around said exhaust ports, the improvement comprising:

an exhaust manifold provided with mating ends adapted to mate with respective ones of said exhaust ports including cavities formed around the exterior thereof for containing coolant, said cavities terminating proximate said mating ends;

a plurality of resilient adapters each conformed as an annular structure for sealably receiving the exterior surface of said cavities around said mating ends and for sealably engaging said engine around said exhaust ports; and

each of said adapters includes a cylindrical boss provided with a central opening conformed to receive one of said mating ends, said boss expanding to form a flange adapted to abut said engine.

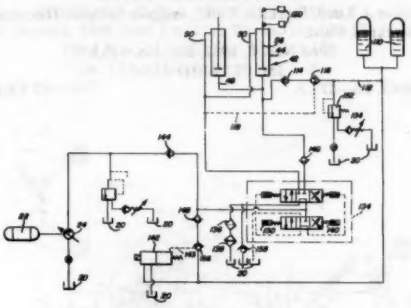
4,512,149

OIL WELL PUMPING UNIT

Paul E. Weaver, P.O. Box 886, Stuttgart, Ark. 72180

Filed Feb. 11, 1982, Ser. No. 348,003
Int. Cl.³ F01L *25/08;* **F01B** *9/00*
U.S. Cl. 60—371 **6 Claims**

1. A well pumping unit comprising a supporting structure including a vertical guide, a slide assembly mounted on the vertical guide, said slide assembly including pulley means thereon, a flexible member entrained over the pulley means with one end anchored stationarily to the supporting structure and the other end connected to the upper end of a polish rod for reciprocating the polish rod vertically, vertically disposed hydraulically operated piston and cylinder means interconnecting the slide assembly and the supporting structure to vertically reciprocate the slide assembly thereby reciprocating the polish rod a distance twice the vertical movement of the slide assembly, said hydraulically operated piston and cylinder means being connected to a hydraulic system having means communicating the piston and cylinder means with accumulator means for storing energy during the downstroke of the slide assembly and polish rod, said hydraulic system including valve means admitting pressurized fluid from the bottom of the piston and cylinder means into the accumulator means during the downstroke and automatically releasing the pressurized fluid from the accumulator means back into the bottom of the piston and cylinder means during the upstroke thereby assisting in the upstroke of the piston and cylinder means and slide



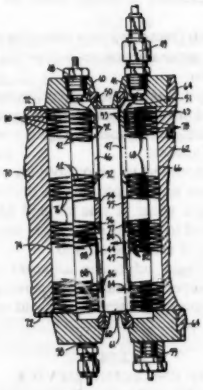
assembly, said vertical guide including a pair of substantially vertical channels, a pair of vertically spaced guide rollers in each channel, said slide assembly including a pair of vertically disposed channels receiving the guide rollers for guiding vertical movement of the slide assembly in relation to the vertical guide.

4,512,150

CONSTANT TEMPERATURE ELEMENT

Glendon M. Benson, Danville, Calif., assignor to New Process Industries, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 244,941, Mar. 18, 1981, Pat. No. 4,446,698, and Ser. No. 292,771, Aug. 14, 1981, abandoned.
This application Jul. 29, 1983, Ser. No. 518,516
Int. Cl.³ F02G *1/00*
U.S. Cl. 60—526 **34 Claims**



1. A constant temperature element for heating or cooling a working gas to the temperature of a control fluid, said element comprising:

a plurality of hollow concentric tapered rings of heat conductive material having a serrate configuration in section with tips projecting into the working fluid;

means for enclosing the bases of the rings except for a ple-

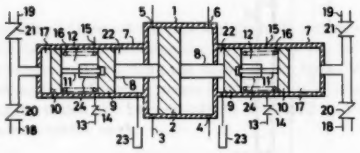
num spanning the rings and having inlet and outlet ends respectively and a barrier at the center; and

means for flowing the temperature control fluid into the inlet end of the plenum so that the control fluid circulates through the rings and exits through the outlet end of the plenum to maintain the rings, and thereby the working fluid adjacent the rings, at substantially the temperature of the temperature control fluid.

4,512,151
INTENSIFIER

Yoshiichi Yamatani, 1870 Manazuru, Manazuru-machi, Ashigarashimogun, Kanagawa-ken, Japan

Continuation of Ser. No. 253,075, Apr. 10, 1981, abandoned, which is a continuation of Ser. No. 53,315, Jun. 29, 1979, abandoned. This application Dec. 23, 1982, Ser. No. 452,510
Claims priority, application Japan, Jul. 13, 1978, 53-085426
Int. Cl.³ F15B *7/00*
U.S. Cl. 60—581 **2 Claims**



1. In an intensifier to intensify fluid pressure of the type including a driving cylinder, a driving piston reciprocal within the driving cylinder to reciprocate a connecting rod, an intensifying cylinder adjacent to the driving cylinder and receiving one end of the connecting rod therein, a first piston connected directly to the connecting rod and being adapted for movement within the intensifying cylinder, the improvement comprising

a second piston adapted for movement within the intensifying cylinder simultaneously with the first piston, the second piston being indirectly connected to the connecting rod;

a movable lubricating chamber defined in the intensifying cylinder intermediate the first and second pistons, the lubricating chamber being moved when the first and second pistons are moved;

the second piston being connected to the first piston by a guiding rod, the guiding rod having a first end connected to the first piston and a second end loosely connected to the second piston, the guiding rod always being positioned within the lubricating chamber, the second piston having limited axial movement within the intensifying cylinder relative to the first piston; and

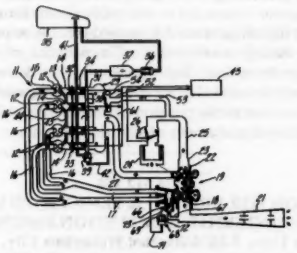
shock absorber means intermediate the connection between the second piston and the guiding rod second end,

the shock absorber means comprising a gap in the second piston, the second end of the guiding rod being loosely retained in the gap and a path between the gap and the lubricating chamber, the path being sufficiently small to restrict the flow of lubricant from the lubricating chamber into the gap to modify the movement of the second piston relative to the first piston in accordance with the compression ratio of the lubricant; whereby variations in pressure in the intensifying cylinder may be compensated by the shock absorber means.

4,512,152
ENGINE WITH SUPERCHARGER

Takao Asaba, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Division of Ser. No. 317,346, Nov. 2, 1981, abandoned. This application Sep. 8, 1983, Ser. No. 529,983
Claims priority, application Japan, May 9, 1981, 56-67339
Int. Cl.³ F02B *37/00, 75/18, 3/00*
U.S. Cl. 60—601 **18 Claims**

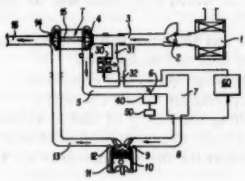


1. An induction system for a supercharged internal combustion engine having an intake device comprising a plenum chamber defined in part by a separable planar wall, said intake device having an outlet communicating said plenum chamber with a chamber of the engine, a supercharging inlet communicating with said intake device plenum chamber for delivering a boosted charge thereto, an atmospheric inlet communicating with said intake device plenum chamber through first check valve means supported in said wall, said first check valve means being adapted to close when the pressure in said intake device plenum chamber exceeds the pressure at said atmospheric inlet by a predetermined amount, and second check valve means supported in said wall communicating said intake device plenum chamber with said atmospheric inlet, said second check valve means being adapted to open when the pressure in said intake device plenum chamber exceeds a predetermined value.

4,512,153
TURBOCHARGER CONTROL SYSTEM

Yasuhiro Kawabata, Anjo, and Motonobu Akagi, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 28, 1982, Ser. No. 454,170
Claims priority, application Japan, Dec. 31, 1981, 56-213058
Int. Cl.³ F02B *37/12*
U.S. Cl. 60—611 **5 Claims**



1. A turbocharger control system for a vehicle engine, comprising:

first air passage means for supplying air to said vehicle;

a throttle valve pivotally mounted in said first air passage means;

a turbocharger having a compressor and a turbine, said compressor being positioned within said first air passage means upstream of said throttle valve;

second air passage means for connecting a portion of said first passage means downstream of said compressor and a portion of said first air passage means upstream of said compressor;

valve means positioned within said second air passage means for relieving fluid pressure from said downstream portion of said first air passage means to said upstream portion of said first air passage means;

throttle sensor means operatively associated with said throttle valve for detecting the position of said throttle valve and generating first signals in response thereto; and

a computer connected to said valve means for receiving said first signals generated from said throttle sensor means, for calculating acceleration of movement of said throttle valve from said first signals and for delivering second signals to said valve means for operating said valve means in response to the position of said throttle valve and acceleration of movement of said throttle valve.

4,512,154

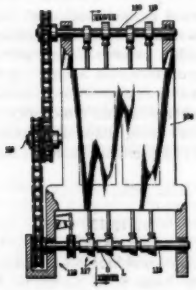
METHOD FOR DRIVING A VEHICLE DRIVEN BY AN INTERNAL COMBUSTION ENGINE

Takahiro Ueno, 5-11, 4-Bancho, Wakayama City, Japan

Continuation of Ser. No. 449,245, Dec. 13, 1982, abandoned, which is a continuation of Ser. No. 110,373, Jan. 8, 1980, abandoned, which is a continuation of Ser. No. 658,601, Feb. 17, 1976, abandoned. This application Jun. 25, 1984, Ser. No. 624,787

Int. Cl.[3] **F01B** *29/04;* **F02N** *9/04*

U.S. Cl. 60—626 **6 Claims**



1. In an internal combustion engine which is convertible to a compressor and adapted for use in a transport vehicle, said engine comprising:

a body including a plurality of working chambers of said engine each of which is provided with an inlet port and an outlet port;

an inlet valve and an outlet valve for opening and closing each of said inlet and outlet ports;

means for supplying fuel to said chambers;

means for supplying air to said chambers;

means for halting the supply of fuel to at least one of said chambers in order to supply only air to said one chamber;

crank-shaft means for the elimination of air from said one chamber;

a cam shaft rotatably and axially adjustably mounted on said body;

a cam change-over mechanism for moving said cam shaft axially;

a pair of cams for each of said inlet valves and each of said outlet valves mounted on said cam shaft, each of said pair of cams comprising an engine and a compressor cam spaced apart from each other;

tappet means reciprocally mounted on said engine in relation to each of said inlet and each of said outlet valves for opening and closing said valves; and

each of the engine and compressor cams of each of said pairs having an inclined surface facing the other cam of the pair and adapted to engage said tappet means;

the improvement which comprises auxiliary cam means disposed between each pair of engine and compressor cams causing said cam change-over mechanism to provide a transitional sequential change including the placing of at least one of said working chambers in an unloaded state.

4,512,155

FLOWING GEOTHERMAL WELLS AND HEAT RECOVERY SYSTEMS

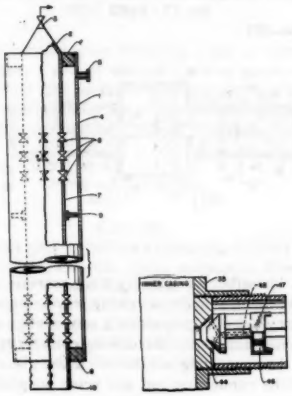
Itzhak Sheinbaum, 136 Walnut Ave., Monrovia, Calif. 91016

Division of Ser. No. 99,674, Dec. 3, 1979, Pat. No. 4,364,232. This application Dec. 21, 1982, Ser. No. 451,884

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.[3] **F03G** *7/00;* **B63H** *3/00*

U.S. Cl. 60—641.2 **12 Claims**



1. A process causing a geothermal well to flow, comprising: injecting a primary fluid into a geothermal well; controlling the level of injection and the rate of injection of primary fluid by a plurality of control valves in a casing of the geothermal well; flowing the geothermal fluid mixture from said well and utilizing the heat of the flowed mixture; and operating the mechanism of said valves by balancing the effect of the velocity of the fluid at the face of the valve to control the rate of fluid flow through the valve.

4,512,156

GEOTHERMAL ENERGY CONVERSION SYSTEM

Ushiro Nagase, Kyoto, Japan, assignor to Kyoto Central Co. Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 213,293, Dec. 5, 1980, abandoned, which is a continuation of Ser. No. 946,977, Sep. 29, 1978, abandoned. This application May 16, 1983, Ser. No. 495,197

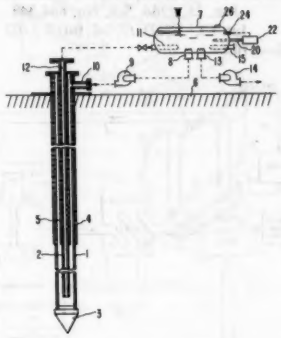
Claims priority, application Japan, Sep. 30, 1977, 52-118146

Int. Cl.[3] **F03G** *7/04*

U.S. Cl. 60—641.2 **4 Claims**

1. Apparatus for using subterranean heat for heating a liquid comprising: a circulation pipe having a pair of opposed ends and a length sufficient to permit the pipe to extend into the earth to a region of subterranean heat; a tank for containing a liquid to be heated, said tank adapted to be placed adjacent to the surface of the earth, said pipe being coupled at the ends thereof to the tank and being in fluid communication with the

tank so that a liquid in the tank can flow through the pipe to said region and return to the tank, whereby the pipe and the tank form parts of a first closed loop, said tank having means for keeping the liquid therein at a constant pressure and temperature to keep the liquid in the tank from boiling; a pump outside the tank and coupled to the pipe for causing a circulation of liquid through the pipe and the tank; and means coupled with the tank for directing the liquid out of the tank to a heat exchanger and returning the liquid to the tank, whereby the tank and the directing means form parts of a second closed loop in which the heat energy in the liquid can be used to perform useful work.

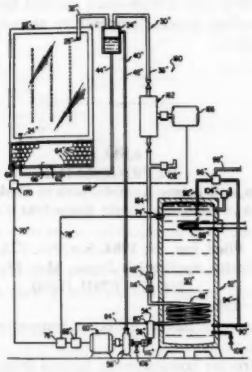


4,512,157

SOLAR POWERED FLUID HEATING SYSTEM

Glenn E. Weadock, Dallas, Tex., assignor to Wetzel Enterprises, Inc., Dallas, Tex.

Filed Feb. 7, 1983, Ser. No. 464,715
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641.8 **37 Claims**



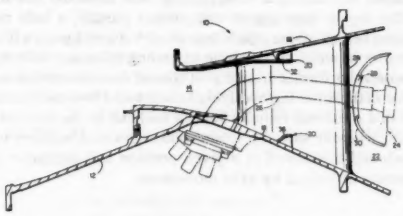
1. A solar powered water heating system comprising:
a predetermined quantity of refrigerant;
a thermal collector for heating the refrigerant;
separator means for receiving the heated refrigerant from the thermal collector and for separating the vapor component from any liquid component of the heated refrigerant;
a tank having a predetermined quantity of water therein;
a condenser positioned within the tank for receiving the vapor component of the heated refrigerant from the separator means and for transferring heat from the refrigerant to the water in the tank and thereby returning the refrigerant vapor to the liquid phase;
vapor conduit means extending from the separator means to the condenser;
liquid conduit means extending from the condenser to the separator means and from the separator means to the thermal collector;
said thermal collector, separator means, condenser, vapor conduit means and liquid conduit means comprising a closed refrigerant circuit which contains the predetermined quantity of refrigerant;
refrigerant pressurizing means for causing the refrigerant to flow through the closed refrigerant circuit; and
solar powered means for actuating the refrigerant pressurizing means which comprises a turbine driven by refrigerant vapor flowing through the vapor conduit means from the separator means to the condenser, and a generator driven by the turbine.

4,512,158

HIGH BLOCKAGE DIFFUSER WITH MEANS FOR MINIMIZING WAKES

Edmund E. Striebel, South Windsor; John A. Matthews, Melrose; Domingo Sepulveda, Vernon, and Francis C. Pane, Jr., South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 16, 1983, Ser. No. 504,995
Int. Cl.³ F02C 7/20
U.S. Cl. 60—740 **1 Claim**



1. For a gas turbine engine having a burner receiving working fluid medium, an annular diffuser having an inner wall and outer wall in axial alignment with the burner but, spaced from said burner directing said working fluid to said burner, a portion of said air discharging from said diffuser entering said burner and a portion of said air admitted to a space surrounding said burner, a fuel nozzle in the front end of said burner in axial alignment with said diffuser, a nozzle support structure extending from a hole in said outer wall of said diffuser extending for a portion transverse to the flow and for the remaining portion axially to support said fuel nozzle, said support structure being an obstruction to the flow passing through said diffuser, means for minimizing wakes in said flow, occasioned by the obstruction of said support structure, including a pair of wall members extending into the passageway of said diffuser spaced from and being on opposite sides of said nozzle support structure for diverging the flow of air adjacent said nozzle support structure and succeedingly converging said flow downstream of said support structure relative to the flow of air in said diffuser, said inner wall and said outer wall being generally conically shaped, one of said pair of wall members being attached to said inner wall and the other of said pair of wall members being attached to the outer wall, one of said pair of wall members and said outer wall defining a prediffusing section and said other pair of wall members being generally bellmouth shaped so that for portion of its axial length of the prediffuser said prediffuser is in diverging relationship, and in the remaining portion of its axial length the prediffuser is in converging relationship.

4,512,159
CLIP ATTACHMENT

Robert L. Memmen, Juno Isles, Fla., assignor to United Technologies Corporation, Hartford, Conn.

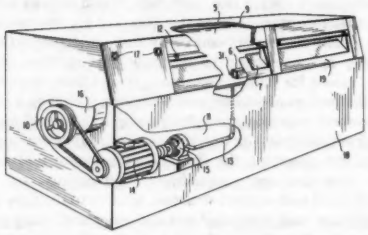
Filed Apr. 2, 1984, Ser. No. 595,859
Int. Cl.³ F23R 3/20
U.S. Cl. 60—752 2 Claims

1. In combination, a combustor for a gas turbine engine having an outer shell and an inner segmented free floating member conforming to the shape of the outer shell defining a combustion section, the segmented members movable circumferentially and axially in response to the combustion products relative to the outer shell, means for securing said segmented members to said outer shell including at least one post integral with each of said segmented members extending radially through an opening in said shell, a clip being generally U-shaped but having at least one leg bent inwardly toward the other leg to bear against the surface thereof, a hole remote from the end of one of said legs sized to fit said post, a first slot smaller in width of said hole extending from said hole to fit a second slot formed in said post spaced from the end thereof, a hole in the other leg overlying said first slot to receive said post so that it extends radially beyond said clip in the secured position, whereby said clip retains said segmented member to said shell and is oriented in a given position and incapable of becoming dislodged by axial movement.

4,512,160
MACHINE FOR MAKING ICE FLAKES FROM SEA WATER OR FRESH WATER

Gonzalo Arias Mas, Nunez de Balboa 31, Madrid, Spain

Filed Dec. 21, 1982, Ser. No. 455,034
Claims priority, application Spain, Dec. 21, 1981, 508.206; Nov. 29, 1982, 517.788
Int. Cl.³ F25C 7/12
U.S. Cl. 62—71 5 Claims

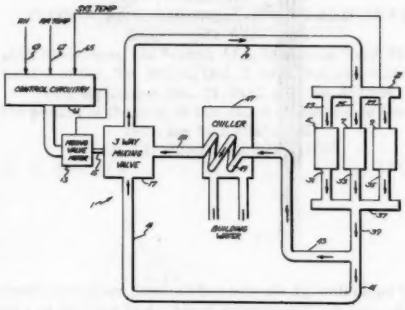


1. A machine comprising means for making ice flakes by freezing water onboard a ship, including a drum rotatable about a horizontal axis, means to cool the drum to below the freezing point of water, means to spray water on the drum, means to collect water falling from the drum, means to supply to said collecting means make-up water to be frozen, said collecting means comprising a plurality of tanks having at least one vertical divider partition therein, and an opening through a lower portion of the divider partition through which the tanks communicate with each other.

4,512,161
DEW POINT SENSITIVE COMPUTER COOLING SYSTEM

Max C. Logan, Maplewood, and Jon T. Nordstrom, Forrest Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 471,953, Mar. 3, 1983,. This application Jun. 25, 1984, Ser. No. 604,348
Int. Cl.³ F25D 17/04; B01F 3/02
U.S. Cl. 62—176.6 15 Claims



1. In a cooling system for a computer installed in an environment, said cooling system including cooling conduits and coolant flowing through said cooling conduits to cool said computer, said cooling system further including a means for controlling the temperature of said coolant, an improvement, comprising:

a means for estimating the dew point of said environment;

a means for sensing the temperature of said cooling system;

a means for comparing said estimated dew point temperature with said cooling system temperature to determine a temperature differential; and

circuit means responsive to said temperature differential for controlling said temperature control means to maintain said cooling system temperature above said dew point temperature.

4,512,162
REFRIGERATOR

Kazumi Etou, and Tetsuo Komoto, both of Osaka, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 24, 1984, Ser. No. 573,346
Claims priority, application Japan, May 18, 1983, 58-88078
Int. Cl.³ F25D 19/00
U.S. Cl. 62—298 12 Claims

1. A refrigerator having a freezer compartment comprising:

an outer box;

an inner freezer compartment, spaced from said outer box;

a layer of insulating material between said outer box and said inner compartment;

a main evaporator mounted in said inner compartment;

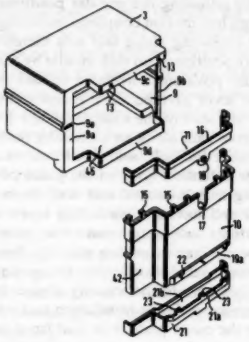
an auxiliary evaporator mounted in said inner compartment and connected to said main evaporator;

said inner compartment having a back opening for permitting insertion into said inner compartment, in assembling both said evaporators,

means for covering said opening on which said main evaporator is attached;

a support member secured to said inner compartment along an upper edge of said opening for attaching said covering means to said inner compartment;

means for dividing the space within said inner compartment to define an air passage therein; and



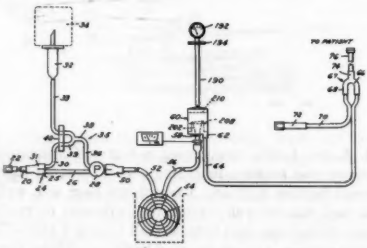
a fan motor for circulating cooled air in said passage and inner compartment.

4,512,163

INTEGRATED CARDIOPLEGIA DELIVERY SYSTEM

Edward S. Wells, Whitmore Lake; Spencer K. Ford, Dexter; Jack E. Werner, Ann Arbor, and Erin J. Lindsay, Dexter, all of Mich., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 279,175, Jun. 30, 1981, Pat. No. 4,427,009.
This application Nov. 3, 1983, Ser. No. 548,298
Int. Cl.³ B67D *5/62*
U.S. Cl. 62—394 **6 Claims**



4. A cooling system for cardioplegia and other uses which comprises:

(a) a body of cooled liquid such as ice water,

(b) a cooling tank to hold cooled liquid at varying levels in said tank,

(c) a cooling coil for holding liquid to be cooled, said cooling coil supported in said tank and having inlet and outlet ends independent of said cooling tank,

(d) means to move said cooled liquid to said tank,

(e) means to control the flow of cooled liquid to said tank, and

(f) a second tank which serves as a receptacle and discharge vessel for said cooling tank;

wherein said cooling tank has one or more openings to discharge said cooled liquid to said second tank at varying levels dependent on the rate of flow of cooled liquid to said cooling tank so as to control the level of cooled liquid in said cooling tank and thus control the area of said cooling coil exposed to said cooled liquid.

4,512,164

PIVOTED LATCH NEEDLE

Masao Fukuhara, Nishimuro, Japan, assignor to Fukuhara Needle Company, Ltd., Wakayama, Japan

Filed Sep. 23, 1983, Ser. No. 535,217
Claims priority, application Japan, Oct. 4, 1982, 57-174841
Int. Cl.³ D04B *35/04*
U.S. Cl. 66—121 **6 Claims**

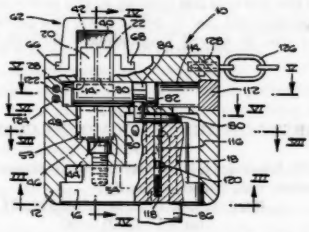
1. A pivoted latch needle for use in knitting machines, the needle having an elongated shank with a hook at one end thereof and with a cheek portion adjacent the hook, a first slot extending through the shank at the cheek portion thereof, a latch pivotally mounted in the first slot, and a second slot extending through the shank adjacent the first slot, the slots being connected with the width of the second slot being less than the width of the first slot.

4,512,165

HIGH SECURITY PADLOCK

Tim M. Uyeda, South San Gabriel, Calif., assignor to La Gard, Inc., Torrance, Calif.

Continuation of Ser. No. 177,251, Aug. 11, 1980, abandoned.
This application Apr. 1, 1982, Ser. No. 364,420
Int. Cl.³ E05B *63/00, 67/36*
U.S. Cl. 70—32 **21 Claims**



1. In a lock assembly adapted for locking two flanges together, where the flanges are secured to support structures and movable to a position adjacent each other, said flanges further including bolt holes positioned for axial alignment when said flanges are in said adjacent position, said lock assembly including a lock body having flange retaining walls defining a flange receiving opening for receiving and holding said flanges in said adjacent position, said lock assembly further including a latch bolt for engaging said flange bolt holes when the flanges are within said flange receiving opening, to lock said lock assembly to said flanges, the improvement in said lock assembly comprising:

removable shield means removably attached to said lock body for covering said flange receiving opening to thereby prevent external access to said latch bolt when said lock assembly is locked to the flanges, said shield means being removable from said lock body only when the retaining walls are removed from retaining contact with said flanges.

4,512,166
CYLINDER LOCK AND KEY

Gerald F. Dunphy, and Donald J. Newman, both of Melbourne, Australia, assignors to Ogden Industries Pty. Ltd., Huntingdale, Australia

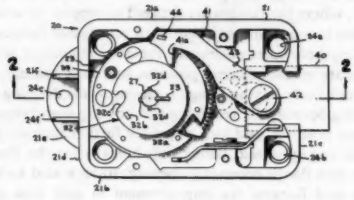
Filed Jul. 23, 1982, Ser. No. 401,417
Claims priority, application Australia, Jul. 29, 1981, PE9982
Int. Cl.³ E05B 15/14, 19/02, 29/02
U.S. Cl. 70—366 31 Claims

1. A key operated cylinder lock including a housing having a cylindrical bore therein, a barrel assembly rotatably mounted within said bore, a plurality of individual discs forming part of said barrel assembly and being arranged for relative rotation about a common axis, a key receiving opening of non-circular shape formed through each said disc at a location such that said common axis passes therethrough, locking means operative to prevent rotation of said barrel assembly relative to said housing and being responsive to the rotational positioning of the discs so as to be rendered inoperative when each said disc has a particular rotational position relative to the adjacent said disc, and at least one camming face is provided at a front side of each said disc at each of two opposite sides of said common axis, said camming faces being arranged for coaction with a key inserted into said lock and each being located directly adjacent the respective disc opening and sloping rearwardly of the said disc towards that opening so that said coaction induces the respective said disc to rotate towards a position at which said key can be moved longitudinally through the opening thereof.

4,512,167
VARIABLE POSITION QUICK MOUNT COMBINATION LOCK

Joseph M. Remenicky, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Aug. 4, 1983, Ser. No. 520,681
Int. Cl.³ E05B 9/00
U.S. Cl. 70—443 18 Claims

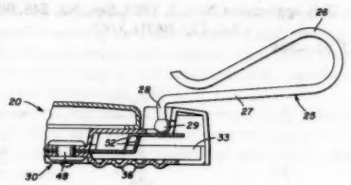


1. A quick mount combination lock constructed to be readily installed or changed to assume any of the four right hand, left hand, vertical up, or vertical down installation positions from externally of the lock case, the lock comprising a front case section having front, side, end, top and bottom walls defining a rearwardly opening substantially rectangular enclosure and a rear cover plate substantially coextensive with said front wall to be removably assembled on the front section and form a closure therefor providing a lock mechanism chamber, a combination lock mechanism including a plurality of peripherally gated tumbler wheels rotatably journaled about a common axis, means for adjusting the angular positions of the tumbler wheels through lost motion couplings including a dial having a drive spindle extending along said axis therefrom and a drive cam adjustably positioned on said spindle by a spline key at any of four angular positions correlated to said installation positions, a fence lever pivoted on a reciprocative bolt slidable through one end wall of the case, the fence lever being movable by the drive cam along an unlocking path when coupled thereto to retract the bolt; said front case section having an integral flange extension lying in the plane of said front wall and protruding from a second end wall thereof opposite said one end wall and having a mounting screw opening therethrough, said front case section and cover plate having aligned mounting screw holes extending entirely therethrough adjacent said second end wall whereby the mounting screws for securing the lock case to the security closure to which it is to be affixed are accessible for installation and withdrawal without removing the cover plate from said front case section, and said cover plate having an access opening therethrough concentric with said common axis located rearwardly adjacent the rearmost end of the spindle for removal and installation of the spline key releasably retaining the driving cam in any of said four angular positions on the spindle, and a removable closure button member releasably secured in said access opening.

4,512,168
KEY HOLDER

Frederick T. Reitze, 5532 S. Kenwood Ave., Chicago, Ill. 60637

Filed Mar. 9, 1981, Ser. No. 242,038
Int. Cl.³ A47G 29/10
U.S. Cl. 70—456 R 8 Claims



1. A key holder comprising a free self-contained circular housing; said housing including a base member having a flat circular bottom wall and a peripheral base side wall integral with said bottom wall around the perimeter thereof and projecting therefrom, said bottom wall having a raised flat planar central portion, a cover member having a circular top wall and a peripheral cover side wall integral with said top wall around the perimeter thereof and projecting therefrom, said top wall having a first depressed flat planar portion centrally thereof, said first depressed portion having a second further depressed flat planar portion centrally thereof, said cover member being disposed over said base member coaxially therewith with said cover side wall overlapping said base side wall around the entire circumference thereof and with said second depressed portion overlying said raised central portion parallel thereto, and attachment means fixedly securing said second depressed portion to said raised central portion for securing said cover member to said base member, said cover member cooperating with said base member to form a substantially closed annular chamber bounded on the outer periphery thereof by said overlapping side walls and bounded on the inner periphery thereof by said raised central portion and said second depressed portion, said housing having a plurality of simultaneously accessible peripheral slots therein spaced apart circumferentially thereof and communicating with said chamber and extending radially into said base member and said cover member for cooperation with said chamber to define a plurality of discrete

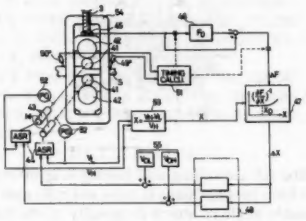
receptacles, each of said slots having an enlarged portion extending into said first depressed portion and a narrow portion; a plurality of key hooks, each of said key hooks having a shank portion dimensioned to pass through the narrow portions of said slots and an enlarged mounting portion dimensioned to pass through the enlarged portions of said slots but to be unable to pass through the narrow portions of said slots; and a retainer in said housing between said cover member and said base member, said retainer having a central attachment portion clamped between said second depressed portion and said raised central portion, and a plurality of resilient portions carried by said attachment portion and engageable with said first depressed portion of said cover member for respectively closing said enlarged portions of said slots, each said resilient portion being deflectable by said mounting portion of one of said key hooks for opening said enlarged portion of the corresponding one of said slots to permit insertion of said mounting portion into said chamber and removal of said mounting portion from said chamber for mounting and demounting said key hook with respect to said housing.

4,512,169

AUTOMATIC PLATE THICKNESS CONTROL DEVICE

Keiichi Miura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,469
Claims priority, application Japan, Feb. 15, 1982, 57-23905
Int. Cl.³ B21B *37/12*
U.S. Cl. 72—16 **6 Claims**



6. In a rolling mill of the type comprising upper and lower rollers between which a rolling material is compressed by a rolling load F, a method for automatically controlling the thickness of said rolling material, comprising the steps of

rotating said upper and lower rollers at different speeds V_H and V_L, respectively, to produce a differential peripheral speed rate X defined by the equation

$$X = \frac{V_H - V_L}{V_H};$$

detecting a variation in rolling material thickness;

generating a deviation rolling load signal WF as a function of said detection variation;

detecting said differential peripheral rolling speed X;

generating a correcting differential peripheral speed rate signal ΔX as a function of the equation

$$\Delta X = -\left(\frac{\partial F}{\partial X}\right)^{-1}(\Delta F);$$

and

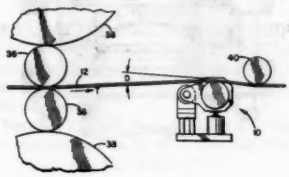
correcting said speeds V_H and V_L of said upper and lower rollers, respectively, as a function of said correcting differential peripheral speed rate signal ΔX.

4,512,170

PROCESS AND APPARATUS FOR STRIP FLATNESS AND TENSION MEASUREMENTS

Yu-Wen Hsu, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 30, 1983, Ser. No. 537,868
Int. Cl.³ B21B *37/04*; G01L *5/04*
U.S. Cl. 72—17 **18 Claims**



1. A process for monitoring a continuously moving metal strip in a rolling mill comprising the steps of selecting a first and second pair of load-sensing positions, continuously supporting the moving strip under tension on an endless unitary surface rotatable about an axis and intermediate the first and second pair of load-sensing positions with the individual positions of a given pair being located at a different end of said axis and the locations of the positions of one pair of load-sensing positions being disposed in opposed relationship on an opposite side of said axis with respect to the other pair of load-sensing positions, continuously and simultaneously measuring a reaction characteristic for at least three of the load-sensing positions relative to theoretically calculated flat strip values and continuously making determinations of the unflatness of the strip from the measured reaction characteristics.

18. A dual-support shape roll, comprising:

a roll having a cylindrical roll body for supporting a length of strip and a pair of roll necks for supporting the roll body extending axially from the roll body along the cylindrical axis thereof;

a pair of inner bearings at the opposite ends of said roll and receiving the respective roll necks therein;

a pair of pivot plates at the opposite ends of said roll, said pivot plates having means for respectively mounting said pair of inner bearings;

first pivot means for pivotably supporting said pivot plates to allow said pivot plates to pivot about an axis parallel to the axis of said cylindrical roll;

a pair of tension load cells in contact with said pivot plates to measure the respective loads imposed thereon;

a pair of outer bearings at the opposite ends of said roll and receiving the respective roll necks therein, each of said pair of outer bearings being disposed further from said roll body than the respective inner bearings;

a pair of pivot arms at the opposite ends of said roll, said pivot arms having means for respectively mounting said pair of outer bearings;

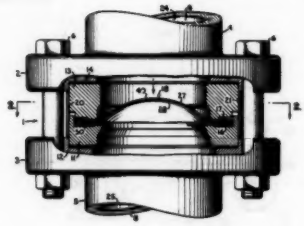
second pivot means for pivotably supporting said pivot arms on the respective said pivot plates to allow said pivot arms to pivot about an axis parallel to the axis of said cylindrical roll; and

a pair of flatness load cells in contact with said pivot arms to measaure the respective bending loads imposed upon said outer bearings.

4,512,171
METHOD FOR FORMING RUPTURE DISC

Robert M. Mozley, Raytown, Mo., assignor to Continental Disc Corporation, Kansas City, Mo.

Filed Sep. 20, 1983, Ser. No. 533,854
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—55 11 Claims



1. A method of manufacturing a reverse buckling rupture disc comprising the steps of:

(a) providing a disc support structure including a source of hydraulic fluid;

(b) placing a generally circular and planar blank to be formed into said disc in said support structure such that said hydraulic fluid source communicates with only one side of said blank;

(c) placing a forming ring on the side of said blank opposite the side thereof communicating with said hydraulic fluid; said forming ring being generally annular in shape and having an interior diameter approximately equal in length to a projected peripheral diameter of a dome of the disc to be formed;

(d) applying sufficient pressure to said forming ring to maintain said ring in position with the adjacent portion of said blank; while

(e) simultaneously applying a preselected pressure to said hydraulic fluid such that a dome portion of said blank bulges through said forming ring thereby producing a disc having a pre-bulged dome, a flange portion surrounding said dome, and a transition region between said flange portion and said dome; said dome including a crown; and

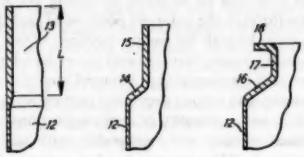
(f) applying pressure to said dome in an unsymmetrical manner at a location spaced from both said transition region and said crown so as to form an indentation thereon.

4,512,172
METHOD OF FORMING FLANGED CONTAINERS

James B. Abbott, Newbury; Ernest O. Kohn, Abingdon; Christopher Berry, Wantage, and Mark N. Slade, Farringdon, all of England, assignors to Metal Box plc, Reading, England

PCT No. PCT/GB81/00169, § 371 Date Mar. 5, 1982, § 102(e) Date Mar. 5, 1982, PCT Pub. No. WO82/00785, PCT Pub. Date Mar. 18, 1982
PCT Filed Aug. 27, 1981, Ser. No. 359,654
Claims priority, application United Kingdom, Sep. 8, 1980, 8029005
Int. Cl.³ B21D *19/06, 22/00*
U.S. Cl. 72—68 15 Claims

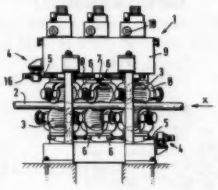
1. A method of forming a shoulder, neck and flange at an open end of the cylindrical side wall of a can body, comprising a die necking operation followed by a rolling operation, wherein the die necking operation includes a static die necking step in which a marginal edge portion defining the open end of the side wall is forced into a die to make a portion of reduced diameter having a shoulder portion supporting a cylindrical portion, the rolling operation includes a rolling step in which the portion of reduced diameter is rolled so as to further reduce the diameter of the cylindrical portion and generate a rereduced shoulder supporting said neck, and forming a flange at a terminal end portion of said cylindrical portion.



4,512,173
TUBE RELEASE ROLLING MILLS

Hans Brauer, Leichlingen, and Hans-Dieter Gerhards, Monheim, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,472
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227532
Int. Cl.³ B21B *19/08*
U.S. Cl. 72—98 18 Claims



1. In a tube release rolling mill having four or more driven rolls which form pass openings in pairs and rolls axes extending at an adjustable angle of attack diagonally to the longitudinal direction of tubes rolled therebetween and in which the roll axes of each roll pair run diagonally in an intersecting manner in different directions, the improvements comprising the rolls being identicallly designed and having a working surface width of more than 1 times the advance distance per revolution of a tube bloom with the largest outside diameter to be rolled therein; said roll pair spacings are dimensioned equal to one of 1.5, 2.5, 3.5, 4.5, 5.5, and 6.5 times the advance distance per revolution of the tube bloom with the smallest outside diameter to be rolled therein and said angle of attack of the rolls is between 33 and 55 degrees.

4,512,174
COMBINED SHEET BENDING BRAKE AND PLATFORM

James J. Rhoades, Garden City, Mich., assignor to Tapco Products Company, Inc., Detroit, Mich.

Filed Jun. 7, 1982, Ser. No. 385,461
Int. Cl.³ B21D *5/04*
U.S. Cl. 72—319 14 Claims

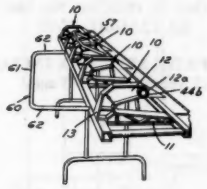
1. A combined sheet bending brake and platform comprising a base,

first and second bending members hinged to one another and mounted on the base,

an anvil member attached to the first bending member for clamping a workpiece of sheet material on said first member such that moving the second member relative to the first member will bend the sheet material, said first and second bending members and anvil member extending longitudinally and horizontally, the longitudinal extend of

the members constituting the length of the sheet bending brake with said hinge axis extending parallel to said sheet bending brake length,

and a platform for workpieces and the like extending longitudinally for at least a portion of the length of the sheet bending brake along the base generally parallel and opposite to the hinge axis of the two members such that the area overlying the brake is generally unobstructed,



said platform being movable horizontally between an extended position extending rearwardly of the brake away from the hinge axis and a position toward the hinge axis within the confines of the brake, the movement of said platform being movable in a direction transverse to the longitudinal extent of the platform.

4,512,175

SWASH PLATE TYPE COMPRESSOR SHOE AND MANUFACTURING METHOD THEREFOR

Yoshihiro Kaku, and Keiichiro Otsu, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

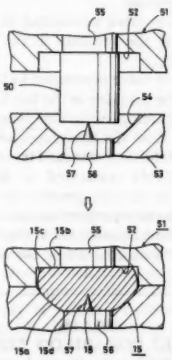
PCT No. PCT/JP81/00067, § 371 Date Nov. 27, 1981, § 102(e) Date Nov. 27, 1981, PCT Pub. No. WO81/02767, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 28, 1981, Ser. No. 328,547

Claims priority, application Japan, Mar. 28, 1980, 55-39842; Mar. 31, 1980, 55-41387; Mar. 31, 1980, 55-41388; Oct. 29, 1980, 55-151907

Int. Cl.³ B21J *13/02*

U.S. Cl. 72—360 **18 Claims**



1. A method for manufacturing a swash plate type compressor shoe by pressing toward each other a first die with a hemispherical recess and a second die with a substantially flat end wall spaced from said second die and arranged along an axis of said hemispherical recess to subject a columnar element interposed between said hemispherical recess and said flat end wall to plastic deformation in the direction of said axis and along the inner surface of said hemispherical recess and flat end wall, wherein, by axial pressure of said dies, a surface of said columnar element is subjected to plastic deformation along said inner surface of said hemispherical recess, and an end face of said element is urged against said flat end wall to constrain said end face of said element and to radially outwardly expand that intermediate part of said element which extends axially toward said flat end wall from said hemispherical recess while subjecting the surface of that intermediate part of said columnar element to plastic deformation into a hemispherical part whose cross-sectional area is gradually increased outward along the surface of said hemispherical recess and a flank whose cross-sectional area is gradually reduced from said hemispherical part axially toward said flat end wall of said second die, and said flank is kept free of contact with said second die throughout the formation of said flank.

4,512,176

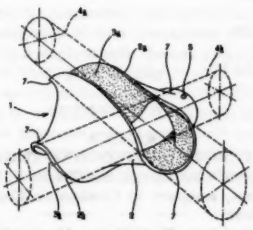
COUPLING MEMBER AND METHOD OF MANUFACTURING SUCH A COUPLING MEMBER

Jean-Francois Pennel, 132, Boulevard de l'Hopital, 75013 Paris, and Patrick H. Vesnier, 6, rue Euryale Dehaynin, 75019 Paris, both of France

Division of Ser. No. 211,137, Nov. 28, 1980, Pat. No. 4,440,519. This application Feb. 3, 1984, Ser. No. 576,959

Int. Cl.³ B21D *53/36*

U.S. Cl. 72—367 **10 Claims**



1. A method for making a coupling element for coupling together two elongated members extending at an angle to each other comprising the steps of, providing a one-piece closed loop band of a ductile material, the band having a sidewall curving around a central axis, and first and second ends, each having continuous rims, positioning the band between a first elongated tool having an axis extending diametrically of the band, and a second elongated tool having an axis extending diametrically of the band and at an angle to the first tool, so that the continuous rim of the first end of the band faces the first tool and the continuous rim of the second end of the band faces the second tool, at least one of said tools have transverse dimensions, transverse to the length of the tool which are less than the facing diameter of the band, and moving the tools toward each other to deform the rim of the first end of the band around the first tool and to simultaneously deform the rim of the second end of the band around the second tool as a result of the forces exerted on the band by said tools.

4,512,177

METHOD OF MANUFACTURING METALLIC MATERIALS HAVING A CIRCULAR CROSS SECTION

Chihiro Hayashi, and Kazuyuki Nakasuji, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 28, 1983, Ser. No. 508,720

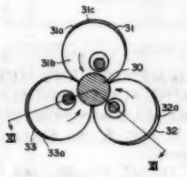
Claims priority, application Japan, Jun. 30, 1982, 57-114362; Feb. 10, 1983, 58-20753

Int. Cl.³ B21B *27/02*

U.S. Cl. 72—368 **14 Claims**

1. A method of manufacturing metallic bar or rod having a circular cross-section which comprises the steps of producing a solid bar-form material having a cross-section which is circular or a polygon of six or more sides and thereafter elongating the said material into a circular cross-sectional bar or rod of

reduced diameter by working said material in a rotary mill, said rotary mill comprising three or four rolls arranged around a pass line for the material being worked, the axes of the rolls being inclined so that the shaft ends on the material inlet side of the rolls are at a cross angle γ from the pass line, said axes being inclined at a feed angle β so that the shaft ends on same side of the rolls face the same circumferential side of the material being worked, said rolls being supported at their respective



both ends, and said cross and feed angles being within the following ranges:

$0° < \gamma < 15°$

$3° < \beta < 20°$

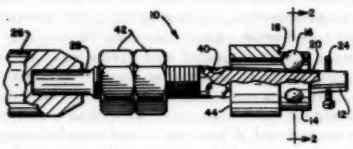
$5° < \gamma + \beta < 30°$.

4,512,178

TUBE END DEFORMING TOOL

Milton L. Blevins, Chattanooga, and Charles R. Seiter, Hixson, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 28, 1983, Ser. No. 479,762
Int. Cl.³ B21D *41/02, 53/02*
U.S. Cl. 72—393 **4 Claims**



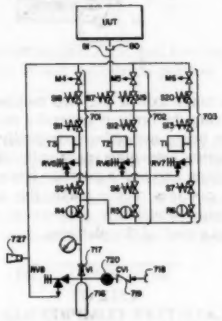
1. A tube deforming tool including a tapered mandrel, the mandrel having a small diameter at its forward end and a larger diameter at its rearward end, a housing with a plurality of radially movable balls mounted therein surrounding the mandrel, the housing having a forward end closest to the forward end of the mandrel, and a rearward end closest to the rearward end of the mandrel, the housing having openings therein adjacent the location of each ball, collar means surrounding the mandrel at the rearward end of the housing and adapted to abut against the end of the tube to be deformed, means for moving the mandrel without rotation thereof, but longitudinally of the ball housing, a plurality of longitudinal grooves in the mandrel, therebeing one for each ball, the grooves being such that as the mandrel is moved longitudinally through the ball housing into the tube interior, the balls are moved radially outwardly by the increasing diameter of the tapered mandrel, until the balls contact and eventually deform the tube wall, an enlarged recess at the end of each of the grooves near the rearward end of mandrel, such that when the balls drop into the recesses, they are removed from contact with the tube wall, thereby forming dimples of a given size in the outer tube wall and permitting easy withdrawal of the tool from the tube.

4,512,179

INSTRUMENT FOR CALIBRATING PRESSURE GAUGES

Don G. Umble, San Martin; Tsi-Pin Choong, Sunnyvale; Kenneth R. Izzo, San Jose; Charles E. Burdg, San Martin; Gary H. Hankin, and Charles A. Dalke, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Oct. 28, 1983, Ser. No. 546,739
Int. Cl.³ G01L *27/00*
U.S. Cl. 73—4 R **9 Claims**
MICROFICHE APPENDIX INCLUDED
(3 Microfiche, 139 Pages)



1. A portable calibration apparatus for supplying a pressure test signal to a pressure gauge unit under test, which unit under test is of the class that transduces pressure into an electrical signal out, in combination with a fluid conduct and an electrical cable connecting the calibration apparatus to the unit under test, the apparatus comprising:

(a) a fluid pressure supply;

(b) a test line, having an inlet, an outlet and a test port;

(c) a transducer in the test line, between the inlet and outlet, which transducer communicates with the interior of the test line to receive pressure of the fluid and emit an electrical signal in response;

(d) an inlet remote valve connected to the fluid pressure supply to enable the pressure in the test line to be increased;

(e) an outlet remote valve connected to the outlet of the test line, to enable the pressure in the test line to be decreased;

(f) a computer, including means for comparing the electrical signal received from the transducer to a signal generated by the internal reference standard transducer, which computer is operatively connected to the inlet and outlet remote valves to increase pressure or decrease pressure responsive to the comparison; and

(g) a test remote valve, connected to the test port, for outletting the pressure maintained in the test line to the unit under test.

4,512,180

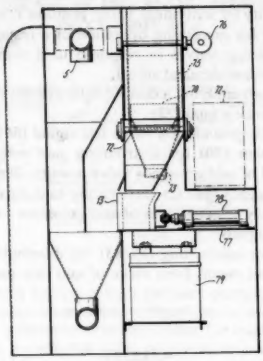
PELLET DURABILITY TESTER

John D. Payne, Whitchurch, England, assignor to Holmen Chemicals Limited, Hampshire, England

Filed Jan. 21, 1983, Ser. No. 460,014
Claims priority, application United Kingdom, Jan. 28, 1982, 8202417; Jun. 9, 1982, 8216770
Int. Cl.³ G01N *3/56*
U.S. Cl. 73—7 **16 Claims**

1. A pellet durability tester comprising means for defining an air re-circulation path into which pellets may be introduced to determine their durability, means for introducing into the re-circulation path for testing a sample batch of pellets, means for removing the whole pellets remaining of the batch after testing and means for establishing the relative quantities of

whole pellets in the sample before and after testing and thereby the durability of the pellets, and a diverter member movable between a first position in which it causes the batch material to



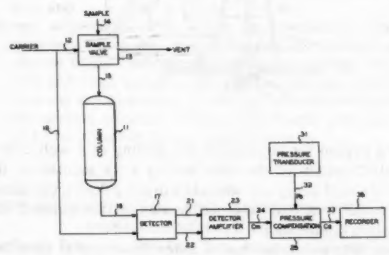
continue re-circulating in the re-circulation path and a second position to deliver the material from the re-circulation path to the establishing means.

4,512,181

PRESSURE COMPENSATION FOR A CHROMATOGRAPH

Buell O. Ayers, and Edwin K. Clardy, both of c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Feb. 17, 1983, Ser. No. 467,547
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—23.1 **6 Claims**



1. In a chromatographic analyzer system for analyzing the composition of a sample, wherein said chromatographic analyzer system has a detector means for providing an output signal (C_m) having an amplitude which varies as a function of time in accordance with the sample composition and wherein said chromatographic analyzer system is calibrated at a barometric pressure P_c, the improvement comprising apparatus for compensating for errors in said output signal, said errors being produced by changes in barometric pressure from the barometric pressure P_c, said apparatus comprising:

means for establishing a first signal representative of the actual barometric pressure (P_a) at the time an analysis is made using said chromatographic analyzer system;

means for determining the slope (M) of a plot of C_m divided by the magnitude that C_m would have if errors were not introduced by changes in barometric pressure (C_a) as a function of P_a/P_c for said detector means and for said sample;

means for calculating a pressure compensation factor using P_c, P_a and M; and

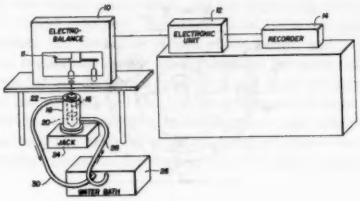
means for dividing said output signal by said pressure compensation factor to compensate for errors in said output signal produced by changes in barometric pressure from the barometric pressure P_c.

4,512,182

GELATION MEASURING APPARATUS AND METHOD

Syed S. H. Rizvi, and Patricia W. Gossett, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 26, 1983, Ser. No. 498,386
Int. Cl.³ G01N *33/02*
U.S. Cl. 73—64.1 **13 Claims**



1. An apparatus for continuously measuring the coagulation, gelation or denaturation of food components and related biomaterials utilizing a single sample thereof, comprising:

a container for holding the sample;

temperature control means connected to the container for controlling the temperature of the sample; and

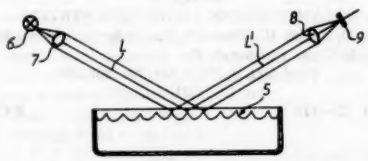
sensing means contacting the sample, said sensing means being dimensioned such that the coagulation, gelation or denaturation of the sample generates a force applied to the sensing means.

4,512,183

METHOD OF MEASURING AND/OR MONITORING THE SURFACE TENSION OF FLUIDS

Martin Alexander, Wilhelm-Kuhnert-Str. 24, 8000 München 90, Fed. Rep. of Germany

PCT No. PCT/EP83/00013, § 371 Date Aug. 1, 1983, § 102(e) Date Aug. 1, 1983, PCT Pub. No. WO83/02500, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 18, 1983, Ser. No. 522,180
Int. Cl.³ G01N *13/02*
U.S. Cl. 73—64.4 **8 Claims**



1. Method of measuring and/or monitoring the surface tension of a fluid, in which standing capillary waves are produced on the surface of the fluid by means of an oscillation generator of a known frequency and are optically evaluated, characterised by the following features:

(a) a circular region of the surface of the fluid is excited centrally or peripherally by the oscillation generator;

(b) the wavelength of the capillary waves thus produced or the radius of the excited circular surface region is altered until a system of circular standing capillary waves is produced; and

(c) the occurrence of circular standing capillary waves is determined by measuring the intensity of light radiation reflected on the surface of the fluid.

4,512,184

MOUNTING ARRANGEMENT FOR ANGLE MEASURING DEVICE

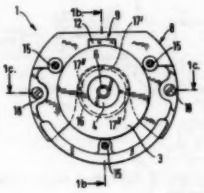
Alfons Ernst, Traunreut, and Arthur Brunner, Trostberg, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 26, 1983, Ser. No. 517,349

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228507

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 **12 Claims**



1. In an angle measuring device for an external drive unit, wherein the drive unit comprises a drive shaft and an attachment surface adjacent the drive shaft, and wherein the angle measuring device comprises a graduated disc, a connecting hub mounted to the disc and secured to the drive shaft, a stator mounted to the attachment surface, and a scanning unit mounted to the stator to scan the disc, the improvement comprising:

a centering collar defined by the attachment surface, concentric with the drive shaft; and

a plurality of radial alignment surfaces defined by the stator, said alignment surfaces positioned to engage the centering collar in order to center the stator radially on the attachment surface with respect to the drive shaft, and thereby to align the scanning unit properly with the graduated disc, during the mounting of the stator to the attachment surface;

said stator shaped to allow the stator to be mounted to and removed from the drive unit by radial movement of the stator with respect to the drive shaft while the disc is secured to the drive shaft in order simultaneously to mount and align both the stator and the scanning unit in place.

4,512,185

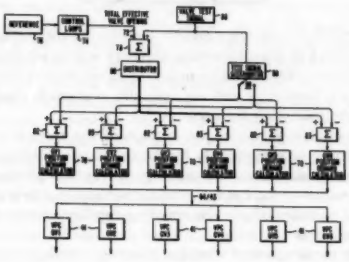
STEAM TURBINE VALVE TEST SYSTEM

William D. Ghrist, III, Blawnox, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1983, Ser. No. 538,390

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **8 Claims**



1. A valve test system for a steam turbine having at least a throttle valve and a plurality of governor valves for controlling steam admission to the turbine, comprising:

(a) calculator means (**70**) for generating a plurality of individual governor valve position demand signals;

(b) a plurality of individual valve position control circuits (**41**) each for governing operation of a respective one of said governor valves in response to a respective input valve position demand signal;

(c) means for supplying a desired total effective valve opening reference signal (**72**);

(d) means for providing a valve test signal (**86**);

(e) first means (**80**) for distributing said reference signal among all of said governor valve position demand signals;

(f) second means (**88**) for distributing said valve test signal among only selected ones of said governor valve position demand signals;

(g) means for subtracting (**82/83**) the distributed signals of said second means from those of said first means.

4,512,186

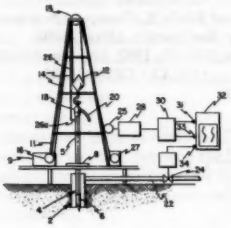
DRILL RATE AND GAS MONITORING SYSTEM

Bruce K. Edwards, Jackson, Miss., assignor to Location Sample Service, Inc., Rankin County, Miss.

Filed Apr. 27, 1983, Ser. No. 488,941

Int. Cl.³ E21B *47/00*

U.S. Cl. 73—151.5 **8 Claims**



1. In a system for monitoring the drilling of a well with a rotary drill system of the type having a bit secured to the bottom of a drill string and wherein a drilling fluid is circulated through said well and returned to the surface thereof, the combination comprising:

a. recording means having an index drive and at least two recording channels;

b. means for producing a succession of depth signals representative of the incremental advance of the drill string during drilling operations;

c. variable scaler means responsive to said depth signals for producing one of a plurality of scale signals having different relative values and for selecting said one of said signals;

d. means responsive to the scale signal from said scaler means to actuate the index drive of said recorder by an amount proportional to the value of said scale signal to produce a depth index;

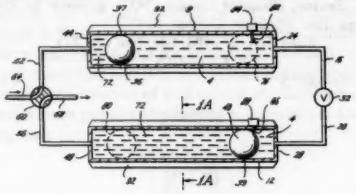
e. means for applying a gas signal to a recording channel of said recording means to provide a record of the quantity of gas detected in drilling fluid returned to the surface as a function of said well depth index;

f. means responsive to said depth signal for producing a signal representative of the rate of penetration of the drill string and for applying said rate of penetration signal to another recording channel of said recording means to provide a record of said rate of penetration signal as a function of said well depth index.

4,512,187
FLOW RATE CONTROLLER

Peter L. Sigwardt, Houston, Tex., assignor to Getty Oil Company, Houston, Tex.

Filed Nov. 19, 1981, Ser. No. 322,729
Int. Cl.³ G01F *3/02*
U.S. Cl. 73—198 **16 Claims**



1. In a system having a high pressure pumping means for injecting a viscous shear-sensitive liquid into a subsurface earth formation, an adjustable flow controller for establishing such injection at a preselected flow rate against a variable rock pressure in said formation, said flow controller comprising

first chamber means having first and second ports and a displacement liquid therebetween,

first barrier means responsive to said pumping means and disposed in said first chamber means for isolating said displacement liquid from said first port therein,

second chamber means having third and fourth ports and a displacement liquid therebetween,

second barrier means responsive to said pumping means and disposed in said second chamber means for isolating said displacement liquid from said fourth port therein,

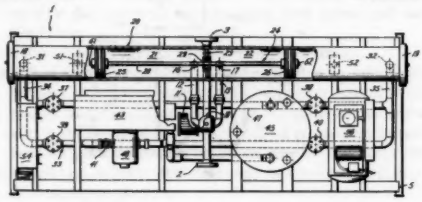
first adjustable valve means interconnecting said chamber means for selectively constricting the flow of said displacement liquid between said second and third ports therein as a function of said rock pressure in said formation, and

second adjustable valve means interconnected with said pumping means and said formation for delivering said viscous liquid into said first chamber through said first port and from said second chamber through said fourth port and for alternately delivering said viscous liquid into said second chamber through said fourth port and from said first chamber through said first port.

4,512,188
FLOW RATE CONTROL AND METERING MEANS FOR SHEAR-SENSITIVE LIQUIDS

Charles D. Erickson, Houston, Tex., assignor to Getty Oil Company, Houston, Tex.

Filed Aug. 25, 1982, Ser. No. 411,469
Int. Cl.³ G01F *15/02*
U.S. Cl. 73—198 **8 Claims**



1. In a system having a high pressure pumping means for injecting a viscous shear-sensitive liquid into a subsurface earth formation, an adjustable flow control assembly comprising

an elongate cylinder means having a pair of first ports adjacent opposite ends thereof, a pair of second ports adjacent the middle of said cylinder means, and an annular wall member fixedly disposed between said pair of second ports,

a piston assembly comprising a rod member slidably positioned through said wall member and having a first piston head disposed at one end between and isolating the ports on one side of said wall member from each other and a second piston head disposed at the other end of said rod member between and isolating the ports on the other side of said wall member from each other,

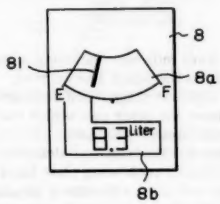
a control valve means interconnected with said second ports for conducting shear-sensitive liquid from said pumping means into said cylinder means between said wall member and one of said piston heads and for displacing shear-sensitive liquid into said formation from between said wall member and the other of said piston heads, and

a flow regulating means interconnected between said first ports for conducting a control liquid from between said one piston head and the first port adjacent thereto to the interior of said cylinder means between said other piston head and the other of said first ports at a flow rate functionally related to the rock pressure in said formation.

4,512,189
LIQUID QUANTITY DETECTING DEVICE

Junji Kitagawa; Shigeyuki Akita, both of Okazaki, and Sotoo Kitamura, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 30, 1982, Ser. No. 403,481
Claims priority, application Japan, Aug. 1, 1981, 56-120027
Int. Cl.³ G01F *23/00*
U.S. Cl. 73—296 **6 Claims**



1. A liquid quantity detecting device for detecting the liquid quantity in a tank, comprising:

(a) a float-type liquid-quantity meter having a float provided in said tank, means for generating an electric signal corresponding to the position of said float, and first display means for displaying the liquid quantity in response to the signal from said generating means, said float-type liquid-quantity meter detecting and displaying the quantity of liquid stored in said tank when said quantity is larger than a predetermined quantity; and

(b) a liquid meter comprising,

(i) housings fixed to said tank;

(ii) at least two torsion bar means, one end of each means being fixed to said tank by said housings and the other end of each means being fixed to a supporting member, for twisting in proportion to the weight of said tank and said liquid in said tank;

(iii) twisted angle detection means for detecting an angle of the twisting of said torsion bar means, and comprising first and second electric members which are adapted to move relative to each other in proportion to the twisted angle of said torsion bar means, and are arranged facing each other, said second electric member being positioned at the center of said first electric member whenever said twisting is at a predetermined status defined as zero;

(iv) electrical processing means for generating a signal corresponding to the quantity of liquid in said tank in

response to detections of said twisted angle detection means; and

(v) second display means for displaying liquid quantity in response to said signal from said electrical processing means when the quantity of said liquid to be measured is smaller than said predetermined quantity.

4,512,190
MAGNETICALLY OPERATED LIQUID LEVEL INDICATOR

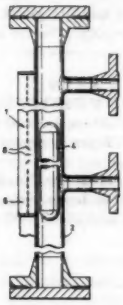
Alan B. Sledmere, Dartford, England, assignor to Klinger AG, Zug, Switzerland

Filed Apr. 8, 1982, Ser. No. 366,763

Claims priority, application United Kingdom, Apr. 14, 1981, 8111798

Int. Cl.³ G01F *23/12*

U.S. Cl. 73—319 **3 Claims**



1. In a liquid level indicator including a magnetized float capable of moving as the liquid level moves;

a plurality of adjacent magnetized indicator elements disposed one above the other past which the float travels as the liquid level rises or falls, and,

support members for the indicator elements,

the indicator elements each being plate-like elements having a pair of opposed ends, a generally longitudinal axis and opposed longitudinal edges each extending from one of said pair of opposed ends to the other,

the indicator elements each being pivotable about its said horizontal axis under the action of the magnetic float when the float lies adjacent thereto so as to provide said liquid level indication,

the support members each being disposed adjacent to a respective said end of the indicator elements, and the indicator elements and support members being adapted for cooperation with one another to allow said pivotable movement of the indicator elements,

the improvement comprising:

each said indicator element being formed from a dimensionally stable collocation of magnetic particles which have been magnetized to provide a magnetic field of one polarity and of substantially constant flux density extending continuously along one longitudinal edge thereof, and a magnetic field of an opposite polarity and of substantially constant flux density extending continuously along the other longitudinal edge thereof, the adjacent edges of adjacent pairs of elements being of opposite polarity and mutually attracting except when they are in the immediate vicinity of said magnetized float; and,

said magnetized float including a magnetized disk having an outer circumferential periphery thereof providing a single continuous magnetic pole of a single polarity and which is supported by said float with the axis of said magnetized disk vertically disposed;

said magnetized disk presenting to said slats a magnetic field that is substantially constant in magnitude throughout its entire periphery without regard to the position of angular rotation of said magnet about said vertical longitudinal axis.

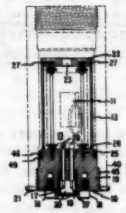
4,512,191
AIR PURIFICATION SYSTEM MONITOR

John M. Sexton, Pleasant Garden, N.C., assignor to Pressure Systems, Inc., Pleasant Garden, N.C.

Filed Jan. 3, 1983, Ser. No. 455,271

Int. Cl.³ G01N *1/00*

U.S. Cl. 73—337.5 **4 Claims**



1. An air purification system monitor comprising; a pressure vessel having a hollow cylindrical body including threaded openings at each end thereof, an end plug having air inlet and discharge openings threadably retained in said cylindrical body at one end to admit air into said cylindrical body, a humidistat-supporting end plug threadably retained in said cylindrical body at the other end, said humidistat-supporting end plug having an axial opening therethrough and a humidistat-retaining housing mounted thereon for retention in said cylindrical body and having an opening to receive air therein from said cylindrical body, a humistat mounted in said humidistat-retaining housing, said humidistat having sealed and insulated electrical conductor terminals extending from said humidistat into said plug axial opening for connection to an audible or visual signaling device upon humidistat detection of conditions varying from preset conditons.

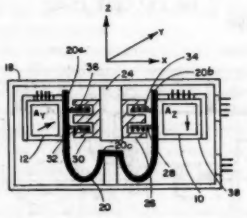
4,512,192
TWO AXIS ANGULAR RATE AND SPECIFIC FORCE SENSOR UTILIZING VIBRATING ACCELEROMETERS

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Sep. 2, 1983, Ser. No. 528,772

Int. Cl.³ G01C *19/56, 23/00*; G01P *15/08*

U.S. Cl. 73—505 **7 Claims**



1. An angular rate measuring apparatus comprising:

a first accelerometer having a first force sensing axis;

a second accelerometer having a second force sensing axis;

vibrating means for vibrating said first and second accelerometers along a vibration axis;

alignment means for securing said first accelerometer to said vibrating means such that said first force sensing axis is

normal to said vibration axis and for securing said second accelerometer to said vibrating means such that said second force sensing axis is normal to both said vibration axis and said first force sensing axis; and

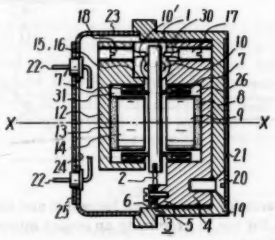
processing means operatively connected to said first and second accelerometers for generating a first rate signal from the output signal of said first accelerometer representing the angular rotation of said first accelerometer about a first axis parallel to said second accelerometer force sensing axis and for generating a second rate signal from the output signal of said second accelerometer representing the rotation of said second accelerometer about a second axis parallel to said first accelerometer force sensing axis.

4,512,193

ACCELEROMETER

Michio Fukano, Kuroiso, Japan, assignor to Kabushiki Kaisha Tokyo Keiki, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,735
Claims priority, application Japan, Nov. 25, 1981, 56-188924
Int. Cl.³ G01P *15/13*
U.S. Cl. 73—517 B **4 Claims**



1. An accelerometer comprising:

a flexible pivot;

a first frame to which one end of said flexible pivot is fixed;

a pendulum, one end of which is fixed to the other end of said flexible pivot;

a pair of torquers for generating a torque in proportion to an acceleration applied through said first frame to said pendulum;

a displacement detecting means for electrically detecting a relative displacement between said first frame and said pendulum;

a second frame engageable with said first frame;

said first frame having an attaching portion to which said one end of said flexible pivot is fixed, a hole within which one of said pair of torquers is received, a recess within which the other end of said pendulum is movably located without contact therebetween, a pair of apertures into which said displacement detecting means is inserted, and a first engaging portion;

said second frame having a hole within which the other of said torquers is received and a second engaging portion, said first and second frames being coupled through said first and second engaging portions; and

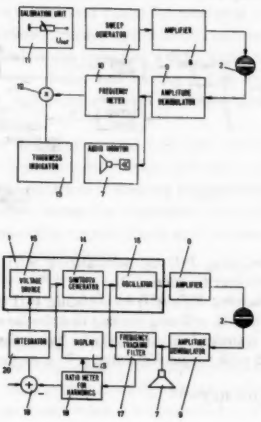
said displacement detecting means being formed of a light emitting element inserted into one of said apertures and a light receiving element inserted into the other of said apertures.

4,512,194

METHOD AND APPARATUS FOR CONTROLLING OR MEASURING THE THICKNESS OF MATERIAL LAYERS

Karl Beuter, Frankfurt am Main, Fed. Rep. of Germany, assignor to Battelle-Institut E.V., Frankfurt, Fed. Rep. of Germany

PCT No. PCT/EP82/00069, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982, PCT Pub. No. WO82/03455, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 29, 1982, Ser. No. 448,913
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113025
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—579 **6 Claims**



1. An apparatus to determine a thickness of a material layer, comprising:

(a) a sweep generator to generate an ultrasonic signal which covers a multiple of an interference interval, the sweep generator has:

(i) an adjustable band width; and

(ii) an adjustable modulation rate;

(b) an amplifier to amplify the generated signal;

(c) a transmitting transducer to transmit the amplified signal into the material layer wherein the transmitted signal is reflected from surface interfaces of the material layer resulting in interference signals;

(d) a receiving transducer to receive the interference signals from the material layer;

(e) an amplitude demodulator to demodulate the received signals; and

(f) a means to analyze frequencies of the demodulated interference signal and correlate the frequencies of the interference signal to a thickness measurement of the material layer.

4,512,195

ULTRASONIC LIVING BODY TISSUE CHARACTERIZATION METHOD

Hirohide Miwa, Kawasaki, and Mitsuhiro Ueda, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 25, 1983, Ser. No. 516,555
Claims priority, application Japan, Jul. 26, 1982, 57-129902
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—602 **3 Claims**

1. An ultrasonic living body tissue characterization method wherein an ultrasonic wave pulse is transmitted by a measuring system into a living body, the reflected signals are received by the measuring system and a living body tissue characteristic is

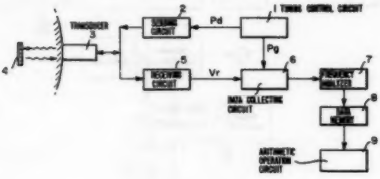
measured by analysing said received signals, said method comprising the steps of:

(a) analyzing the frequency of signals reflected from the region to be measured to obtain the power spectrum of said reflected signals, Er(f);

(b) obtaining the power spectrum Eo(f) of the measuring system by using a standard reflector positioned in the region equivalent to be measured in a non-attenuative medium;

(c) normalizing the power spectrum Er(f) obtained in step (a) with the power spectrum Eo(f) to obtain the transfer function R(f) of a living body tissue, at the region to be measured;

(d) obtaining the transfer function R(f) at a particular frequency fo;



(e) obtaining P(f) by normalizing R(f) with R(fo) at the particular frequency fo;

(f) obtaining P(f)/A(f) by dividing P(f) obtained in step (e) with A(f), utilizing the fact that the function Q(f), which is the transfer function R(f) of a living tissue model, normalized with its specific value at fo is expressed in the form of

$$Q(f)=A(F)*e^{B(f)},$$

(g) expressing the function obtained in step (f) using logarithmic operators; and

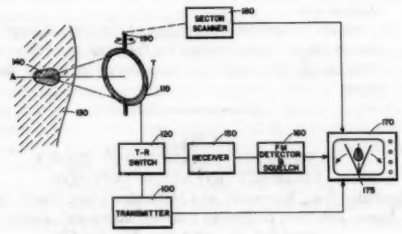
(h) obtaining the optimum values of parameters of the functions A(f) and B(f) using regression processing such that the function obtained in step g is considered to be equal to the function B(f).

4,512,196

ULTRASOUND IMAGING WITH FM DETECTION

Casper W. Barnes, Newport Beach, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,021
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—620 **3 Claims**



1. An ultrasound imaging system comprising, in combination:

an ultrasound transducer having an annular acoustic aperture;

means which excite the transducer to emit pulses of ultrasound energy and which produce electrical echo signals representative of echos of said pulses which are received by the transducer;

FM detector means connected to receive the echo signals and to produce therefrom a detector output signal having an instantaneous amplitude which is proportional to the instantaneous frequency of the echo signals; and

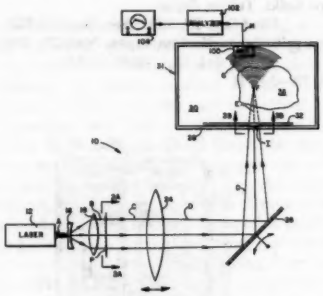
display means which produce an image by generating pixels whose brightness is a function of the detector output signal at points in an image which are mapped to correspond with the points of origin of the corresponding ultrasound echos.

4,512,197

APPARATUS FOR GENERATING A FOCUSABLE AND SCANNABLE ULTRASONIC BEAM FOR NON-DESTRUCTIVE EXAMINATION

Robert J. von Gutfeld, New York, and Sherman S. Wang, Pleasantville, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1983, Ser. No. 528,708
Int. Cl.³ G01N *29/00*; G10K *10/00*
U.S. Cl. 73—643 **13 Claims**



1. Apparatus for generating a focusable and scannable ultrasonic beam for use in examining an object internally comprising in combination:

a pulsed laser for generating a light beam;

light modifying means optically connected to said light means for producing an optical zone pattern having alternating light and dark zones in said light beam, said light modifying means including, an optical mask having alternating reflecting and transmitting ring zones, said ring zones having radii determined by a preselected acoustic wavelength in a predetermined propagation medium, an optial lens slidably disposed in the path of the light beam after it emerges from said optical mask for forming an image of the optical zone pattern on a focal plane, and an oscillatable mirror disposed in the path of the light beam after the lens for scanning the light beam; and

light absorbing means disposed in the path of light beam and in contact with a propagation medium surrounding the object to be examined for propagating an ultrasonic beam through said medium when an image of the optical zone pattern is formed on said light absorbing means.

5. Apparatus for generating a focusable and scannable ultrasonic beam for use in examining an object internally, comprising:

light means for generating a light beam, said light means comprising a pulsed laser;

light modifying means optically connected to said light means for producing an optical zone pattern having alternating light and dark zones in the light beam, said light modifying means including signal generator means for generating an acoustic chirp signal and acousto-optic

means for modulating the light beam with the acoustic chirp signal; and

light absorbing means disposed in the path of said light beam and in contact with a propagation medium surrounding the object to be examined for propagating an ultrasonic beam through said medium when an image of the optical zone pattern is formed on said light absorbing means.

4,512,198

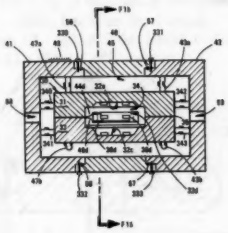
SURFACE ACOUSTIC WAVE SENSORS

Bikash K. Sinha, West Redding, and Michel Gouilloud, Norwalk, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 427,240, Sep. 29, 1982,. This application Aug. 1, 1984, Ser. No. 636,515

Int. Cl.³ G01L 9/08

U.S. Cl. 73—703 **2 Claims**



1. A surface acoustic wave signal frequency apparatus comprising a crystalline diaphragm section having a cylindrical or spherical outer surface and a cylindrical or spherical inner surface, said outer surface being adapted for subjection to an applied isotropic force and said inner surface having an area thereof of a selected crystal lattice arrangement and adapted for the fabrication of a surface acoustic wave device.

4,512,199

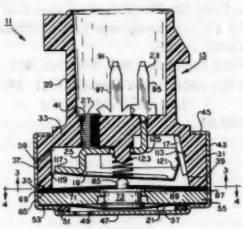
TRANSDUCER

Stewart A. Woodward; Ronald L. Hilty, both of Morrison, Ill., and Donald H. Stoll, North Mankato, Minn., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 6, 1983, Ser. No. 482,531

Int. Cl.³ G01L 9/02

U.S. Cl. 73—725 **15 Claims**



1. A transducer adapted for connection in circuit relation with a power source and in pressure fluid communication with a fluid pressure source to establish an output voltage proportional to an input fluid pressure supplied from the fluid pressure source, the transducer comprising:

a pair of housing members secured together against displacement, one of said housing members including a pair of opposite end walls with a sidewall interposed therebetween, a recess intersecting with one of said end walls, and a threaded opening in the other of said end walls intersecting with said recess, the other of said housing members including another sidewall extending generally in confronting relation about said first named sidewall, a closure wall integral with said another sidewall and extending generally across said one end wall and said recess, and at least one passage means in said closure wall adapted for connection in the pressure fluid communication with the fluid pressure source;

resistor means within said recess and adapted for mounting therein at least adjacent said first named sidewall;

a set of terminal means mounted to said other end wall and adapted for connection in the circuit relation with the power source, a pair of said terminal means including a pair of means within said recess for electrical connection across said resistor means, respectively, and another one of said terminal means including a deformable supporting arm within said recess and having a free end portion spaced from said resistor means generally adjacent said threaded opening;

resilient means mounted to said free end portion of said deformable supporting arm within said recess and in pivotally movable electrical contacting engagement with said resistor means between the connection therewith of said electrical connection means of said terminal means pair to establish the output voltage;

a plate extending across said recess and including a pair of stepped bores extending therethrough, and a shoulder defined between said stepped bore;

diaphragm means sealably interposed between said plate and said closure wall and adapted for displacement in response to the input fluid pressure acting thereon and established at said passage means when it is connected in the pressure fluid communication with the fluid pressure source;

piston means adapted for movement in the smaller of said stepped bores in response to the input fluid pressure displacement of said diaphragm means, said piston means including means for engagement with said shoulder to limit the movement of said piston means in said smaller stepped bore, and projection means on said piston extending into said recess for pivotally moving said resilient means about said free end portion of said deformable supporting arm to alter the electrical connection engagement of said resilient means with said resistor means and thereby establish the output voltage upon the movement of said piston means by said diaphragm means in response to the input fluid pressure acting thereon;

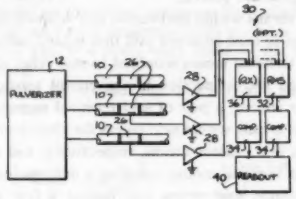
at least one spring including a peripheral portion interposed between said plate and said one end wall, and a plurality of resilient fingers extending from said peripheral portion into overlaying relation with said piston means generally about said projection means thereof and urging said piston means against movement by said diaphragm means, respectively; and

an adjusting screw received in said threaded opening and extending into said recess into engagement with said free end portion on said deformable arm of said another one terminal means, said adjusting screw being adjustably movable in response to a manual adjusting force exerted thereon to effect the deformation of said deformable supporting arm and adjustably move said resilient means toward a calibrated position in its electrical connection engagement with said resistor means thereby to define a predetermined output voltage correlative with a predetermined input fluid pressure at said passage means.

4,512,200
PULVERIZED COAL RELATIVE DISTRIBUTION METER

Walter L. Ghering, Alliance, and William L. Thompson, Montville, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 30, 1983, Ser. No. 556,524
Int. Cl.³ G01F 1/64, 1/74
U.S. Cl. 73—861.04 8 Claims



1. An apparatus for measuring the relative flow of pulverized coal in a plurality of pipes connected between a common pulverizer and a respective plurality of burners, comprising:

a plurality of electric charge sensors, each connected to one pipe at a selected position with respect to the pulverizer, and each for producing an induced signal caused by the passage of charged pulverized coal particles, the selected position for each sensor being similar to each other;

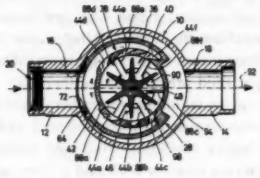
first circuit means connected to said sensors for processing each induced signal to obtain a value of the charge flux, a value proportional to the second integral of the induced signal; and

comparator means for comparing the values of the charge flux for each induced signal as a measurement of the relative flow in each pipe.

4,512,201
FLOW VOLUMETER FOR LIQUIDS

Peter Konrad, Heimsheim, and Adam Mechel, Esslingen, both of Fed. Rep. of Germany, assignors to Wassermesserfabrik ANDRAE GmbH & Co., Leonberg, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,099
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247376
Int. Cl.³ G01F 1/06
U.S. Cl. 73—861.79 18 Claims



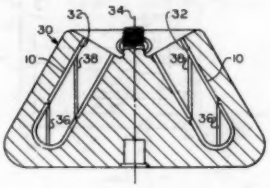
1. A flow volumeter for liquids comprising a cup-shaped outer housing having at its circumference an inflow opening and an outflow opening positioned approximately opposite each other and also comprising a measuring chamber unit insertable into the outer housing, said measuring chamber unit forming an impeller chamber and an inflow chamber embracing said impeller chamber, said inflow chamber having in its central area an inlet opening communicating with the inflow opening as well as an inflow chamber portion on each side of said inlet opening, an impeller being rotatably mounted in the impeller chamber with its axis of rotation approximately perpendicular to the bottom of the outer housing, the impeller chamber also having a circumferential wall in which a plurality of flow-directing openings are located, said flow-directing openings all being undirectionally inclined relative to the radial direction in the direction of rotation of the impeller, and comprising at least one outlet opening from the impeller chamber communicating with the outflow opening,

characterized in that the flow cross sections of the inflow chamber decrease in size on both sides of its inlet opening in the direction of flow and up to termination of each of said inflow chamber portions, and the impeller chamber, when viewed perpendicular to its axial direction, has at least one outlet opening on each side of its flow-directing openings.

4,512,202
PREGROOVED CENTRIFUGE TUBES

Herschel E. Wright, Santa Clara, and Robert C. Wedemeyer, Menlo Park, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 27, 1982, Ser. No. 453,192
Int. Cl.³ G01N 37/00, 1/28
U.S. Cl. 73—863 12 Claims



1. A centrifuge tube for separation of the constituents in a fluid sample and for receipt of a tube slicer blade to partition said tube into at least two sections for isolation of centrifugated bands of constituents of said samples, said tube comprising:

a hollow cylindrical body portion with one end enclosed to form an interior chamber;

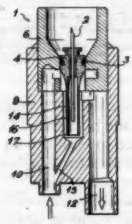
a circumferential groove formed in the exterior surface of said body portion to create at least two sections of said body portion; and

a connecting portion adjacent said groove and joining said two sections, for rejoining said two body sections under force to form a fluid tight seal after said body portion is severed by said tube slicer blade.

4,512,203
LIQUID SAMPLING DEVICE

André Calame-Lonjean, Bagnols sur Ceze, and Pierre Naujalis, Orly, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 19, 1982, Ser. No. 435,274
Claims priority, application France, Oct. 26, 1981, 81 20038
Int. Cl.³ G01N 1/14
U.S. Cl. 73—863.81 12 Claims



1. A liquid sampling device comprising

a support comprising a supply pipe for a liquid to be sam-

pled, a discharge pipe for said liquid, an intermediate tank, and drainage means for said liquid connecting a lower part of said intermediate tank and said supply pipe,

an end fitting held by said support, a lower portion of said end fitting comprising a sleeve immersed in said intermediate tank, a lower end of said sleeve being open, and

at least one hollow needle held by said end fitting.

4,512,204

PUSHBUTTON-OPERATED WAVEBAND OR STATION SELECTOR

Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

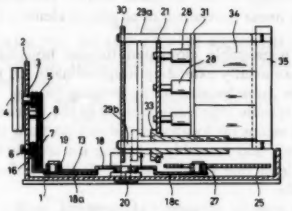
Filed Mar. 25, 1982, Ser. No. 361,608

Claims priority, application Japan, Mar. 31, 1981, 56-46043[U]

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

Int. Cl.³ H03J *5/06;* **F16H** *35/18*

U.S. Cl. 74—10.33 **2 Claims**



1. In a tuner having a pushbutton-operated waveband or station selector in which the tuner has pushbuttons for making station selections, a rotatable tuning knob for making station selections alternatively with the pushbuttons, tuning coil means and tuning core means movable in said tuning coil means and operable by the pushbuttons and the tuning knob for tuning in stations, the combination comprising: a slidable memory plate movable back and forth in a first direction between a plurality of positions which are selectable by operation of said pushbuttons, said first direction extending laterally to the direction of movement of the pushbuttons, and a first elongated guide portion on said memory plate and extending perpendicular to said first direction; a slidable core slide connected to the tuning core means and movable back and forth in a second direction for tuning in stations, said second direction being different from said first direction, and a second elongated guide portion on said core slide and extending perpendicular to said second direction; a slidable idler plate movable in said first direction in response to rotation of the tuning knob, and a third elongated guide portion on said idler plate and extending perpendicular to said first direction; a link having first, second and third arms and means mounting said link for pivotal movement on said tuner, each of said arms having a guide member thereon spaced outwardly from the pivot axis of said link, the guide member on said first arm being slidably received in said third guide portion, the guide member on said second arm being slidably received in said second guide portion and the guide member on said third arm being slidably received in said first guide portion so that movement of said memory plate or said idler plate in the first direction will pivot the link and thereby effect movement of said core slide in the second direction; and a clutch mechanism for coupling the axis of said tuning knob and said idler plate; said clutch mechanism being so arranged to decouple said tuning knob axis and said idler plate in response to advance of said pushbutton.

4,512,205

ARM MECHANISM OF A PUSHBUTTON TUNER

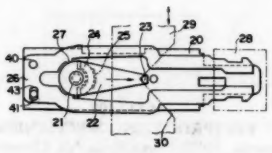
Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 439,852

Claims priority, application Japan, Nov. 11, 1981, 56-167112[U]

Int. Cl.³ H03J *5/12*

U.S. Cl. 74—10.33 **3 Claims**



1. Arm mechanism of a pushbutton tuner comprising:

an arm;

a setting pin disposed on said arm;

a setting plate mounted rotatably on said setting pin;

a plate spring disposed around the periphery of the setting plate on said arm;

a pushbutton mounted at an end of said arm, said plate spring fixing the setting plate to the arm by mounting the pushbutton on the arm;

a guide projection disposed on the lower surface of said setting plate;

a guiding opening disposed on the arm cooperating with said guide projection; and

pressing means for pressing said guide projection towards the guiding opening when the pushbutton is pushed and moves relative to said plate spring.

4,512,206

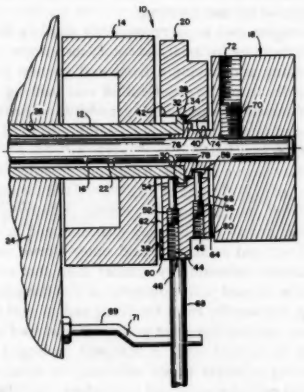
ACTUATING DEVICE FOR ROTATING SHAFTS

James A. Clark, Honeoye Falls, and Alfred P. Gabriel, Rochester, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 23, 1983, Ser. No. 497,469

Int. Cl.³ F16H *35/18*

U.S. Cl. 74—10.54 **11 Claims**



1. An adjusting mechanism comprising:

(a) rotatable means, said rotatable means including a bearing surface and a friction surface, and

(b) actuator means including pivot means and friction means,

said actuator means being rotatably and pivotably supported relative to said rotatable means with said pivot means adjacent said bearing surface and said friction means adjacent said friction surface, whereby when said actuator means is pivoted in a first direction said pivot means engages said bearing surface and said friction means engages said friction surface, whereby said actuator means and said rotatable means may be rotated in unison.

4,512,207

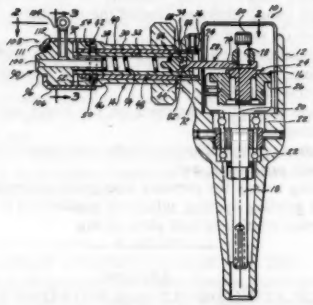
RECIPROCATING MECHANISM

Josef J. Dancsik, 37970 Pointe Rosa, Mt. Clemens, Mich. 48045

Continuation of Ser. No. 305,098, Sep. 24, 1981, abandoned. This application Sep. 2, 1982, Ser. No. 414,077

Int. Cl.³ B24B *23/00*; F16H *21/22*

U.S. Cl. 74—44 **5 Claims**



1. A hand-held reciprocating mechanism for driving a tool in linear reciprocation while accommodating rotation of the tool about its axis of linear reciprocation including:

a main housing;

an elongate, sleeve-like support bushing fixedly mounted at one end on said housing;

an elongate tool support assembly slidably received within said bushing for axial and rotary movement relative to said bushing and having a front end portion projecting outwardly from the other end of said bushing;

drive means in said housing coupled to said tool support assembly for driving said assembly in axial reciprocation within said bushing;

an outer sleeve member rotatively mounted upon the exterior of said bushing at an axially fixed location and having a front end section projecting outwardly beyond said other end of said bushing characterized in that:

the front end section of said outer sleeve member is of a diameter substantially greater than that of said bushing and is formed with a diametrical slot therethrough extending rearwardly from the front end of said front end section, and the front end portion of said tool support assembly is formed with a flattened, enlarged head section having a lateral extent substantially equal to that of the front end section of said outer sleeve member and slidably received and guided within said slot, said enlarged head section having an axial tool receiving passage therethrough and tool clamping means including a member passing radially through said head section at a location in said head section between the walls of said slot.

4,512,208

MECHANICAL ROTARY-TO-LINEAR MOTION CONVERSION ELEMENT

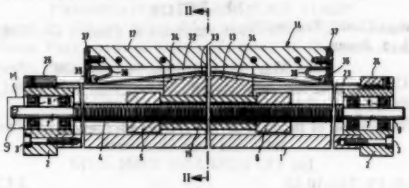
Reinhard Lipinski, Plochingen, and Karl Neff, Waldenbuch, both of Fed. Rep. of Germany, assignors to PROMA Produkt- und Marketing Gesellschaft m.b.H., Plochingen, Fed. Rep. of Germany

Filed Feb. 2, 1983, Ser. No. 463,167

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205143

Int. Cl.³ F16H *1/18*

U.S. Cl. 74—89.15 **18 Claims**



1. Mechanical rotary-to-linear motion conversion element, to provide linear movement of an output element (17) comprising

a stiff, form-stable elongated tubular housing (1) formed with an axially extending longitudinally slit (12);

a spindle drive located in the housing having

a drive spindle (4) axially located in the housing;

bearing means (8) located in the end portions of the tubular housing, and rotatably retaining the spindle therein;

and at least one spindle nut (5, 6) threaded on the drive spindle;

a force transfer element (14) coupled to the at least one spindle nut, extending through the slit (12) and coupled to the output element (17);

cooperating, relatively movable guide means (20, 21) having a first portion (20) coupled to the force transfer element, and a second portion (21) located on the housing, said portions being in mutual, relatively movable engagement with each other, for guiding movement of the force transfer element on the housing upon rotation of the spindle and isolating external forces applied to the force transfer element from the spindle (4);

an elongated, flexible closing strip (23) closing off the slit (12) in the regions between the end portions of the housing (1) and said force transfer element;

wherein said flexible strip (23) is secured to the housing at the end portions thereof;

and said strip includes a holding flange or strip (27) extending transversely to the width of the strip and dimensioned to fit into the slit (12);

and wherein the force transfer element (14) includes

a projecting element (13) projecting through the slit and coupled to the at least one spindle nut;

means (33, 34) lifting the strip (23) out of the slit at both longitudinal sides of said projecting element;

and means (35, 36, 37) located at the respective end portions of the force transfer element and opposite said slit engaging the strip (23) and applying a force thereto to seat the strip against the slit.

4,512,209

STEERING COLUMN

Elmer H. Linnemeier, Washington Depot, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Mar. 18, 1983, Ser. No. 476,589

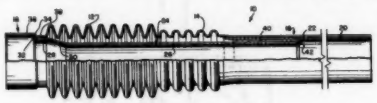
Int. Cl.³ B62D *1/18*

U.S. Cl. 74—492 **4 Claims**

1. A steering column for a steering wheel assembly for a motor vehicle comprising:

a rotatable outer tube having energy absorbing means along a longitudinal portion thereof separating relatively non-energy absorbing upper and lower sections;

a support tube within the outer tube and rotatable with the outer tube, the support tube extending from the lower relatively non-energy absorbing section into the relatively



non-energy absorbing upper section, the support tube contacting the relatively non-energy absorbing lower section with the longitudinal part of the support tube adjacent the energy absorbing means being radially spaced from the energy absorbing means; and

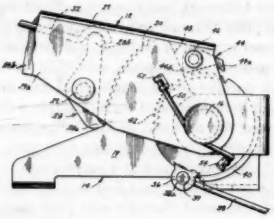
an annular noise dampener separating the relatively non-energy absorbing upper section from the support tube.

4,512,210

PARKING BRAKE LEVER ASSEMBLY

Anthony R. Gurney, Toledo, Ohio, assignor to Donovan Wire & Iron, Toledo, Ohio

Filed Sep. 30, 1982, Ser. No. 431,591
Int. Cl.³ G05G 5/06
U.S. Cl. 74—535 **6 Claims**



1. A lever assembly adapted to be connected to one end of a cable assembly having an opposite end connected to operate a remote mechanism, said lever assembly comprising:

a support member;

a lever pivotally mounted to said support member;

locking means for maintaining said lever in a selected pivoted position relative to said support member; and

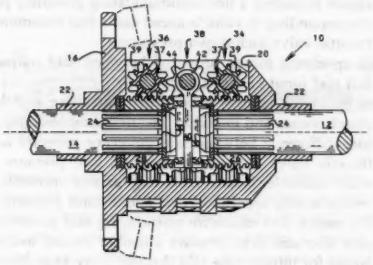
adjusting means for maintaining the cable within a predetermined tension range when said lever is in a non-operating position, said adjusting means including an adjusting element pivotally mounted to said support member, said adjusting element including means for securing the one end of said cable assembly to said element, biasing means for exerting a predetermined rotational force on said element relative to said lever when said lever is in a non-operating position to cause the cable tension to fall within the predetermined range, and means for locking said adjusting element to said lever when said lever is pivoted to an operating position, said biasing means including a spring having one end coupled to said lever and an opposite end coupled to said adjusting element, and said means for locking said adjusting element including a sector of ratchet teeth on said adjusting element and an adjusting pawl pivotally mounted on said lever and adapted to engage one of said ratchet teeth when said lever is pivoted to an operating position.

4,512,211

DIFFERENTIAL ASSEMBLY HAVING MEANS FOR LOCKING AND POSITIONING AXLE SHAFTS THEREIN

Gene A. Stritzel, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,574
Int. Cl.³ F16H 1/38, 1/42
U.S. Cl. 74—745 **9 Claims**



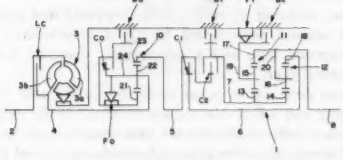
1. In a differential assembly of the type which includes a differential case having means for receiving a pair of axle ends together with a pair of drive gears coupled to said pair of axle ends for rotation therewith, and including spacing means for limiting axial thrust of said axle ends towards each other within said differential assembly, said spacing means comprising a spacing member which can be removably installed between said axle ends so as to define a predetermined spacing between said axle ends within said differential case, said spacing member having a mounting element projecting radially outwardly therefrom for securing said spacing member in its installed position between said axle ends, and securing means for fixing the position of said mounting element relative to said differential case, said securing means comprising a journal pin removably mounted across an access opening formed through said differential case, and including a bore through said mounting element of said spacing means for receiving said journal pin when (a) the spacing means is inserted through the access opening and into its installed position and (b) the said journal pin is mounted in its installed position, to thereby fix the position of said spacing means within said differential case, the improvement wherein the center axis of said bore is perpendicular to and offset from the center axis of said axle ends.

4,512,212

VEHICLE AUTOMATIC POWER TRANSMISSION HAVING A LOCK UP CLUTCH

Kazuo Ishikawa, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 6, 1982, Ser. No. 365,896
Claims priority, application Japan, Apr. 8, 1981, 56-052785
Int. Cl.³ F16H 47/00, 57/10; F16D 33/00; B60K 41/22
U.S. Cl. 74—733 **5 Claims**



1. An automatic power transmission comprising:

a fluid-type torque converter driven by an engine output shaft;

a multiple stage gear transmission having an input element operatively connected to said torque converter, said gear transmission including selectively operable clutch and brake means for providing a plurality of gear trains having different gear ratios;

hydraulic control circuit means for selectively operating said clutch and brake means, said hydraulic control circuit means including a line communicating governor pressure corresponding to vehicle speed and a line communicating throttle valve kick-down pressure;

lock-up clutch means provided between said output shaft and said input element; and

lock-up clutch control means for controlling said lock-up clutch means and including means operable under a pressure difference between said governor pressure and said throttle valve kick-down pressure, said pressure difference operable means including axially movable spool means axially separating first and second pressure chamber means, first means for introducing said governor pressure into said first pressure chamber means, and second means for introducing said throttle valve kick-down pressure into said second pressure chamber means.

4,512,213

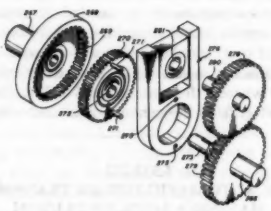
SPEED REDUCER

Alan R. Newton, 67 Bluebird Ave., East Wareham, Mass. 02538

Continuation-in-part of Ser. No. 316,753, Oct. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 218,470, Dec. 22, 1980, abandoned. This application Dec. 12, 1983, Ser. No. 560,540

Int. Cl.³ F16H *1/28*

U.S. Cl. 74—805 **6 Claims**



1. A speed changing mechanism comprising:

a housing,

first and second gear means supported in the housing in planar relationship with one of the gears having external teeth and the other internal teeth and with the number of teeth of one of the gears being less than the number of teeth of the other gear,

means defining an output shaft from said first gear means,

said second gear means having a substantially centrally disposed hole and a peripherally disposed hole, a first pinion gear,

means defining an input shaft supporting said first pinion gear and a first cam means received in the centrally disposed hole of said second gear means,

and a second pinion gear and associated second cam means supported in the peripheral hole of said second gear means.

4,512,214

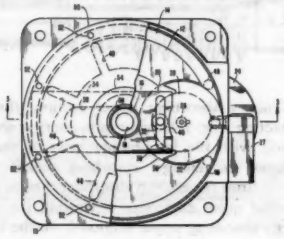
STATION LOCKING ROTARY INDEXING TABLE

William K. Surman, 10 Greenbriar Rd., Green Brook, N.J. 08812

Filed Sep. 19, 1983, Ser. No. 533,346

Int. Cl.³ B23Q *17/00*

U.S. Cl. 74—820 **17 Claims**



17. A rotary indexing table which comprises a mounting base having an upper face defining a stationary plate, said plate having a central hub therethrough and a recessed channel positioned at the upper face of said plate around its circumference said plate further having a slide groove adapted for sliding engagement with a slide element, and further having a bore capable of cooperation with rotating means; a drive disk positioned over said plate, said disk having a central orifice therethrough and a plurality of notches radiating from said orifice and extending a distance spaced from the periphery thereof, a plurality of cam followers mounted at the underside of said disk, said cam followers being positioned and capable of translation in said plate channel; an generally planar table-top member at the upper portion of said disk, a slide element positioned in the slide groove of said plate, said slide having a first slot therethrough parallel to its longitudinal axis and adapted to slide with said hub positioned therethrough, a first end of said slide positioned for periodic locking engagement and disengagement between two adjacent cam followers, a second slot through said slide positioned at a second end thereof perpendicular to and spaced from said first slot; a motor comprising a rotating shaft mounted through said plate bore, a generally crescent shaped rotor member mounted for rotation by said shaft; a needle bearing positioned on said rotor member at the open end of said crescent, perpendicular to the plane containing the upper surface of said rotor, and adapted for revolution around said shaft, said needle bearing being positioned for translation in said second slot of said slide and capable of sequentially engaging and disengaging adjacent disk notches to effect disk rotation about said hub; and switching means capable of signalling the position of said disk.

4,512,215

RADIATOR CAP REMOVING DEVICE

Walter Krauchick, 28 Humphrey St., Seymour, Conn. 06483

Filed May 2, 1983, Ser. No. 490,340

Int. Cl.³ B67B *7/00*

U.S. Cl. 81—3.44 **11 Claims**

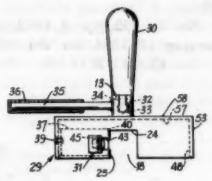
1. A tool for unscrewing an automobile radiator cap from a radiator comprising:

a unitary body member having a cup shape and a bottom rim, said bottom rim having two diametrical notches, and having a chamber for receiving a portion of the radiator cap;

a handle means formed of substantially nonconductive thermal material affixed to said body member for enabling manual rotation of said body member;

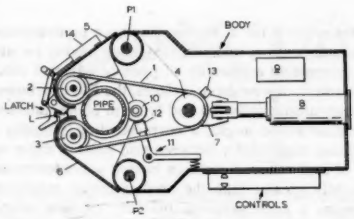
clamping means mountable on said body member and being

manually adjustable for clamping engagement with a portion of the radiator cap; and



whereby the radiator cap being unscrewable from the radiator with rotation of said body member.

4,512,216
PIPE SPINNER
Stephen R. Callegari, Sr., Lafayette, La., and Tommie L. Rogers, P.O. Box 30248, Lafayette, La. 70503, assignors to Tommie Rogers, Lafayette, La.
Filed Jan. 20, 1984, Ser. No. 572,289
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.17 **22 Claims**



1. A powered pipe spinner for joining threaded pipe connections by friction drive of an endless flexible pipe periphery gripping element circulated among drive and guide rollers apparatus comprising:

(a) a body;

(b) opposed pair of jaws movably mounted on said body;

(c) means to synchronize movement of said jaws between a closed and an open position;

(d) means to lock said jaws together in said closed position;

(e) chain guide wheels mounted on said jaws so positioned as to rotate about axes generally parallel with the center axis of pipe to be spun;

(f) a drive wheel carrier movably mounted on said body and means to move said carrier toward and away from the pipe to be spun;

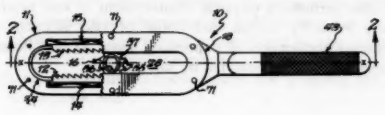
(g) a flexible element drive wheel positioned on said carrier with rotational axis generally parallel the pipe axis situated to tighten and loosen said flexible element by said means to move;

(h) a continuous circulating path for said flexible drive element comprising a positive bight around part of the periphery of said drive wheel, a positive bight around part of the periphery of each of said guide wheels, and a negative bight around part of the periphery of the pipe to be spun;

(i) means to rotate under power said drive wheel mounted on said carrier for sympathetic movement with said drive wheel; and

(j) at least two pipe contact wheels mounted on said jaws with axes generally parallel the axis of the pipe to be spun, so situated that when said jaws are in said closed position, the pipe cannot be moved from between said jaws by the force of said negative bight of said flexible element when under tension because of contact of rollers and pipe.

4,512,217
LINEAR RATCHET
William S. Conover, 351 Huntington Ave., Buffalo, N.Y. 14214
Filed Jul. 22, 1983, Ser. No. 516,110
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—58 **7 Claims**



1. A linearly-reciprocable ratchet wrench, comprising:

an elongated member having an axis, having an axial slot, having a recess extending transversely into said member from either side of said slot, and having a handle connected to and extending axially away from one end of said member in a direction away from said slot;

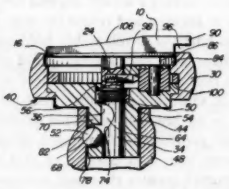
a rack mounted on said member and arranged in each recess for movement toward and away from said axis, each rack having a plurality of ratchet teeth extending into said slot, each of said ratchet teeth having an inclined surface and an abutment surface, one rack being arranged so that the abutment surfaces of its teeth are arranged to face toward said handle, the other rack being arranged so that the abutment surfaces of its teeth are arranged to face away from said handle;

a spring operatively arranged between said member and each rack for urging the associated rack to move toward said axis; and

a socket arranged in said slot for rotational and linear motion relative to said member and having a pawl-like toothed portion engaging the teeth of each rack, and having a recess adapted to receive the head of a fastener, said socket being rotatable in one angular direction when said member is moved in one axial direction relative to said socket and being rotatable in the same angular direction when said member is moved in the opposite axial direction relative to said socket;

whereby an operator may grasp said handle and move said member in either axial direction relative to said socket to rotate said socket in one angular direction.

4,512,218
CONTROL BAR FOR RATCHET WRENCH
Kirk K. Chow, 5902 Bent Trail Dr., Dallas, Tex. 75248
Filed Mar. 19, 1984, Ser. No. 591,029
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—62 **10 Claims**



1. In a ratchet wrench having a rotatably shiftable head for selectively reversing a driving direction of a socket carried by a driving stud of the wrench, a head-encircling driving collar, and control bar means surmounting said head and secured

thereto for manually pivotally manipulating said head to assume a selectable driving mode of said wrench,

the improvement wherein said control bar means includes an integral end portion projecting radially beyond a circumscribing bounding periphery of said head and overlying said collar to provide enhanced ease of annular shifting of said head and increased applied rotational torque thereto during and changing of a driving mode of said ratchet wrench, and

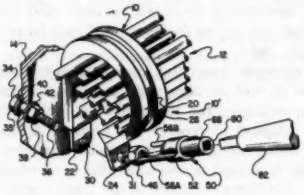
wherein said radially projecting end portion of said control bar means overlying said collar is spaced upwardly of said collar permitting physical displacement of said head axially inwardly within said collar of said wrench upon manual application of depressing force to said head for releasing a socket carried by said wrench.

4,512,219

TOOL FOR INSTALLING ELECTRICAL WIRE HARNESS CLAMPS AND THE LIKE

Caleb E. Janssen, Orange Park, Fla., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 8, 1983, Ser. No. 559,618
Int. Cl.³ B25B *13/06*
U.S. Cl. 81—121.1 **4 Claims**



1. An installation tool for a clamp assembly, said clamp assembly being of the type having apertured end members and being securable by means of a screw and nut assembly extending through the aperture, the tool comprising:

a guide member having first and second ends, said guide member having a pair of legs extending from said first end in mutually spaced relationship adapted to straddle the end members, said guide member further having an aperture therethrough exiting from said first end between said legs;

a drive member having at least a portion thereof greater in diameter than the diameter of said aperture, said drive member further having a socket aligned with said aperture and adapted to receive and rotate the nut; and

retaining means adapted to releasably hold said drive member in alignment with said aperture, said retaining means comprising a plurality of spring retainers mounted on said second end of said guide member, each of said retainers terminating in an inwardly directed protrusion, the distance of said protrusions from said second end being slightly greater than said portion of that drive member having a diameter greater than said aperture;

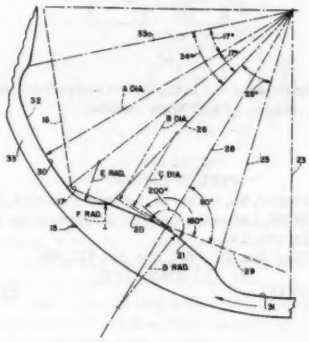
such that said drive member can be installed and retained by said retaining members by inserting said drive member past said protrusions, causing said retainers to yield and thereafter return to their original position, securing said drive member to said guide member.

4,512,220

FAST LEAD SOCKET WRENCH

Martin L. Barnhill, III, Union Grove, and William T. Pagac, Kenosha, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Continuation of Ser. No. 364,255, Apr. 1, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,534
Int. Cl.³ B25B *13/06*
U.S. Cl. 81—121.1 **7 Claims**



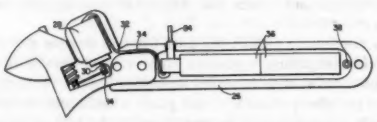
1. A socket wrench for a fastener having a predetermined across-corners dimension, said socket wrench having an internal surface comprising a plurality of pairs of adjacent clockwise and counterclockwise drive surfaces, the drive surfaces in each pair being substantially flat and lying in planes intersecting at a predetermined angle, a corresponding plurality of relieved surfaces respectively between said pairs of drive surfaces, each of said relieved surfaces having a predetermined diameter slightly greater than the predetermined across-corners dimension, a corresponding plurality of first reverse curved surfaces respectively between said relieved surfaces and said clockwise drive surfaces, a corresponding plurality of second reverse curved surfaces respectively being between said relieved surfaces and said counterclockwise drive surfaces, each of said reverse curved surfaces having a given radius and being tangent to the associated relieved surface, each of said relieved surfaces having an angular extent greater than the angular extent of each of said reverse curved surfaces, each of said relieved surface having a radius greater than the radius of each of said reverse curved surfaces.

4,512,221

ELECTRIC POWERED ADJUSTABLE WRENCH

John A. Picone, 195 Quebec Rd., Island Park, N.Y. 11558

Filed Aug. 25, 1983, Ser. No. 526,202
Int. Cl.³ B25B *13/16*
U.S. Cl. 81—170 **5 Claims**



1. In an adjustable jaw wrench comprising:

body means, said body means including an integral handle and a head portion, said head portion defining a stationary jaw;

a movable jaw reciprocally mounted in said body means, head portion in alignment with said stationary jaw, said movable jaw including a rack;

driven means mounted in said body means head portion, said driven means being operably connected to said movable jaw and causing movement of said movable jaw relative to said stationary jaw, and driven means including:

a worm gear rotatably mounted in said body means head, said worm gear engaging said movable jaw rack; and

a first pulley integral with said worm gear, said first pulley being rotatable with said worm gear, said first pulley and at least a portion of said worm gear being positioned in an aperture in said body means head portion whereby said first pulley is accessible from opposite sides of said body means;

drive means mounted in said body means handle, said drive means comprising:

a second pulley rotatably mounted in said handle; and

an endless drive belt, said drive belt extending between said first and second pulleys, the improvement comprising:

a reversible electric motor mounted in said body means handle in driving connection with said second pulley.

4,512,222

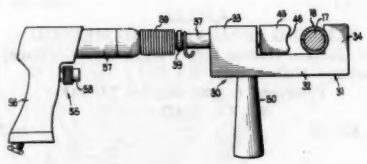
LOOSENING TOOL FOR TIE ROD SLEEVES

Steven L. Christophersen, Clarkston, Mich., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed May 2, 1983, Ser. No. 490,722

Int. Cl.³ B25B *19/00*

U.S. Cl. 81—464 **3 Claims**



1. A loosening tool for loosening the interconnection between two threaded members, comprising a U-shaped body having a bight and spaced-apart upstanding first and second legs, said first leg including a bore therein the axis of which is generally parallel to said bight, said second leg having a leg surface generally mating with the surface of one of the threaded members, said leg surface being part of a cylinder, a shaft slidably disposed in said bore, a hammer on one end of said shaft located between said legs, said hammer having a hammer surface generally matching the surface of the one threaded member, said hammer surface being part of a cylinder, the threaded members being insertable in the space between said hammer and leg surfaces, means on the other end of said shaft for being engaged by a reciprocating air tool to cause the hammer and leg surfaces to repeatedly strike the threaded members so as to loosen the interconnection therebetween, said air tool engaging means being integral with said shaft, and an elongated handle permanently attached to said bight and being directed generally perpendicular to said shaft.

4,512,223

LATHE

Franz Pühringer, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Dec. 22, 1982, Ser. No. 452,340

Int. Cl.³ B23B *15/00*

U.S. Cl. 82—2.5 **3 Claims**

1. A lathe for handling a succession of workpieces having two end faces, which comprises a machine bed whereon there are mounted

(a) two tool units for machining a respective one of the workpieces from both end faces,

(b) a workpiece-gripping drive stock disposed between the two tool units,

(c) a single chuck supported on the drive stock, the drive stock constituting a back rest and serving as a bearing eye for the chuck, and the chuck having an axis and including

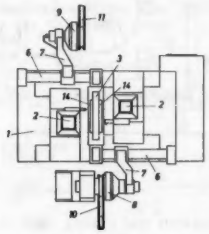
(1) a series of radially displaceable gripping members and

(2) two coaxial rings rotatable relative to each other for actuating the gripping members, an outer one of the rings serving as a pulley for a driving belt whereby the outer ring is driven and each one of the two rings having an annular series of coupling teeth at one end face thereof,

(d) device for loading the one workpiece for machining, the loading device comprising

(1) a rotatable carrier carrying coupling teeth movable into mesh with the coupling teeth of the two coaxial chuck rings and a motor connected to the rotatable carrier for rotating the carrier,

(2) an axially displaceable collet for gripping the one workpiece, and



(3) means for axially displacing the collet under pressure,

(e) a device for unloading a previously machined one of the workpieces, the unloading device comprising

(1) a non-rotatable carrier carrying coupling teeth movable into mesh with the coupling teeth of the two coaxial chuck rings,

(2) an axially displaceable collet for gripping the machined workpiece,

(3) yielding means for axially displacing the collet of the unloading device under the pressure of the axially displaced collet of the loading device, and

(4) an adjustable stop arranged to be engaged by the collet of the unloading device when it is forced back by the pressure, and

(f) means for moving the loading and unloading devices into and out of alignment with the axis of the chuck.

4,512,224

SLITTER DEVICE

Isamu Terauchi, Osaka, Japan, assignor to Kabushiki Kaisha Kindai, Osaka, Japan

Filed Mar. 31, 1983, Ser. No. 481,077

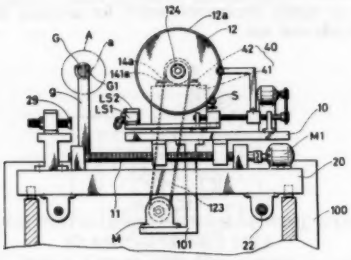
Claims priority, application Japan, Apr. 1, 1982, 57-47933[U]; Jul. 12, 1982, 57-106110[U]

Int. Cl.³ B23B *7/00, 25/04*

U.S. Cl. 82—48 **5 Claims**

1. A slitter device for an elongated roll shaped workpiece having a hollow core comprising: a base, an electrically conductive guide holder support rod having a D shaped transverse cross-section on said base for insertion into the hollow core of a workpiece, means on said base to rotatably drive a workpiece, a longitudinally movable carriage on said base, a transversely movable table on said carriage, a feed motor for moving said table, a bearing, bolts mounting the bearing on said table, a drive shaft rotatably supported by said bearing, a cutting blade fixed for rotation with said shaft, a cutter drive motor and means drivingly connecting said cutter drive motor to said drive shaft, first control means for limiting the movement of said table toward said support rod to prevent contact between said cutting blade and said support rod, safety means

operable in the event of failure of said first control means comprising: a brake means coupled to said cutting blade drive motor for stopping the rotation of said cutting blade drive motor and to stop rotation of said cutting blade, an electrical insulating means provided between said cutting blade and said guide holder support rod for providing electrical insulation between said cutting blade and said rod during non-contact of the two, said insulating means comprising an insulating liner placed between said bearing and said table, insulating washers placed under the heads of said bearing mounting bolts, a belt made from an electrical insulating material coupling said cutter drive motor to said drive shaft, a control circuit which applies an electric voltage between said cutting blade and said support



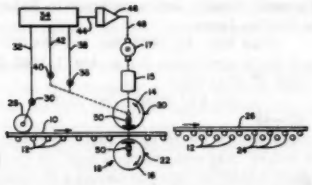
rod and which controls said cutting blade drive motor, said table feed motor and said brake when said cutting blade accidentally contacts said support rod and an electric current flows between said cutting blade and said support rod to stop the rotation of and retract said cutting blade, said control circuit means comprising a first switching means which interrupts current flow to said cutting blade drive motor in response to current flow between said cutting blade and said guide holder support rod and a second switching means which reverses the direction of rotation of said feeding motor in response to current flow between said cutting blade and said guide holder support rod to simultaneously stop and retract said cutting blade from said guide holder rod.

4,512,225

DIFFERENTIAL INTEGRAL ROTARY KNIFE CONTROL

John L. Green, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 18, 1982, Ser. No. 434,763
Int. Cl.³ B26D *5/20*; G05B *19/20*
U.S. Cl. 83—38 **15 Claims**



1. In a continuous sheet cutting process, and method of cutting the continuous sheet of material with a moving knife into predetermined lengths comprising the steps of:

(a) passing a continuous sheet of material past a cut point beneath the knife;

(b) measuring the length of continuous sheet passing a fixed point since the knife last reached a park position;

(c) measuring the distance of travel of the knife from the park position;

(d) comparing the measured length of continuous sheet passing a fixed point since the knife last reached a park position to the distance of travel of the knife from the park position and generating a difference signal therebetween;

(e) holding the knife in the park position until the difference signal exceeds a predetermined value indicating that a first predetermined point on the continuous sheet has reached the cut point;

(f) initiating motion of the knife when the first predetermined point on the continuous sheet has passed the cutting point;

(g) after the difference signal in step (e) exceeds a predetermined value, controllably moving the knife at a rate proportional to the difference in position between

(1) the difference between the first predetermined point on the continuous sheet and the cut point, and

(2) the distance of travel of the knife from the park position

until the knife becomes synchronous with the continuous sheet and the variation in measured position difference is reduced to zero;

(h) after the variation in position difference in step (f) is reduced to zero, operating the knife synchronously with the continuous sheet;

(i) cutting the continuous sheet severing a predetermined length of the continuous sheet of material while the knife is operating synchronously with the continuous sheet; and

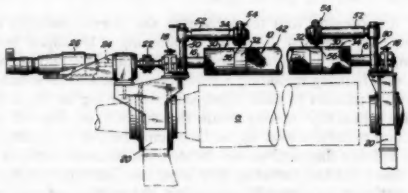
(j) returning the knife to the park position synchronously with the continuous sheet.

4,512,226

SLITTING APPARATUS AND METHOD

David W. Juckett, Hudson Falls, N.Y., assignor to Sandy Hill Corporation, Hudson Falls, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,115
Int. Cl.³ B26D *3/12*
U.S. Cl. 83—56 **4 Claims**



4. In a method of trimming a continuously running wet web, the steps of: running the wet web over a rotatable perforated tube mounting at each end a peripherally arranged hardened sleeve, and driving a rotatable circular cutting knife at each side of the tube into severing contact with the wet web and in confronting relationship with the respective hardened sleeve.

4,512,227

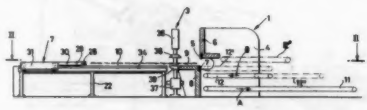
APPARATUS FOR THE AUTOMATIC SHEARING OF A SHEET METAL IN SEVERAL PIECES OF DIFFERENT SIZE

Guido Salvagnini, Sarego, Italy, assignor to Salvagnini Transferica S.p.A., Sarego, Italy

Filed Nov. 22, 1982, Ser. No. 443,694
Claims priority, application Italy, Nov. 25, 1981, 25267 A/81
Int. Cl.³ B26D *7/06*
U.S. Cl. 83—104 **6 Claims**

1. Apparatus for automatic shearing of sheet metal in a plurality of pieces of variable size, comprising a shear having a shearing blade, feeding means for feeding a piece of sheet metal to the shear, at least one movable carrier disposed downstream of the shearing blade and means for selectively causing the movable carrier during a first operation mode to receive and store sheared pieces of sheet metal for their subsequent return

to the feeding means and during a second operation mode to allow sheared pieces to reach a discharge means, said movable carrier being disposed during said first operation mode in at least one piece-receiving working position near the shearing blade and during said second operation mode in a non-piece



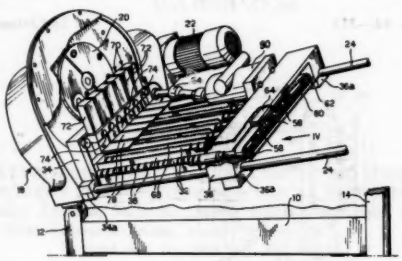
receiving removed position at a distance from the shearing blade such that sheared pieces are prevented from reaching said movable carrier and are allowed to fall on an underlying collecting means for sending sheared pieces to said discharge means.

4,512,228

AUTOMATIC SAUSAGE SLICING MACHINE FOR SALAMI AND LIKE PRODUCTS

Re Tarcisio, Rho, Italy, assignor to Victor Slicing Systems S.r.l., Milan, Italy

Filed Nov. 23, 1982, Ser. No. 444,202
Claims priority, application Italy, Nov. 23, 1981, 25221 A/81
Int. Cl.³ B26D *5/20, 7/06*
U.S. Cl. 83—355 **13 Claims**



1. Automatic sausage slicing machine for salami and the like products, of the type comprising a framework, an orbital blade, an electric motor drivingly connected to the orbital blade, and a feed device for feeding a line of products to be sliced continuously towards the path of displacement of the orbital blade, wherein the improvement consists in the feed device comprising:

a plurality of entrainment shafts located side by side and extending towards the orbital blade;

a plurality of longitudinal containment partitions separating neighboring entrainment shafts;

each entrainment shaft having a helical projection on which a respective product to be sliced rests in use of the machine, said product being inserted between a pair of corresponding said containment partitions;

means for simultaneously rotating the said entrainment shafts in synchronism with the movement of the orbital blade said means for rotating the entrainment shafts being the electric motor which drives the orbital blade;

a sprocket mounted on the end of each entrainment shaft opposite the orbital blade, an endless toothed drive belt engaging said sprocket, and a transmission including a speed variator drivingly connected to said drive belt, the transmission being driven by the electric motor;

presser means for retaining the active pass of the drive belt in engagement with the corresponding zones of said sprockets, and means for maintaining the inactive pass of the drive belt spaced from the said sprockets; and

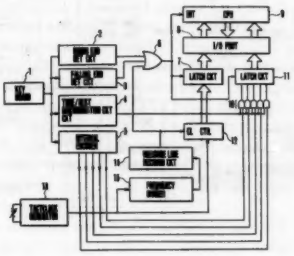
a drive sprocket driven by the transmission means, the drive belt passing over said drive sprocket, which is disposed at a level different from that of the sprockets carried by the entrainment shafts, whereby the inactive pass of the drive belt between the said drive sprocket and the sprocket associated with the entrainment shaft furthest from the drive sprocket does not interfere with the remaining entrainment shaft sprockets and further including a plate acting on the active pass of the drive belt, and means pressing said plate resiliently towards the entrainment shaft sprockets.

4,512,229

SCORING SYSTEM

Kenji Kamiya, and Masatoshi Hosoi, both of Ena, Japan, assignors to Ricoh Watch Co., Ltd., Gifu, Japan

Continuation of Ser. No. 377,225, May 11, 1982, abandoned.
This application Jul. 17, 1984, Ser. No. 631,571
Claims priority, application Japan, May 18, 1981, 56-74758
Int. Cl.³ G10H *7/00*
U.S. Cl. 84—1.01 **8 Claims**



1. A music scoring system for scoring music arranged in measures, said system comprising:

(a) a clock generator;

(b) a counter for counting clock signals generated by the clock generator;

(c) means for clearing the contents of the counter;

(d) means for summing a series of quantized note/rest length values during each measure of the music to be scored; and

(e) means for subtracting the current sum generated by the summing means from the value stored in said counter and converting the result thereof to a new quantized note/rest length value.

4,512,230

ELECTRONIC MUSICAL INSTRUMENT

Sadaaki Ezawa, and Hiroshi Kitagawa, both of Shizuoka, Japan, assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Apr. 25, 1983, Ser. No. 488,289
Claims priority, application Japan, Apr. 26, 1982, 57-69970
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.24 **2 Claims**

1. In combination with an electronic musical instrument having a plurality of panel tone control switches and having a plurality of internal memories each of which stores the switch states of a setting of said plurality of panel tone control switches, apparatus for externally augmenting the number of said plurality of internal memories comprising;

a plurality of external memories each of which stores the switch states of a setting of said plurality of panel tone control switches,

a panel memory means for storing the switch states of said plurality of panel tone control switches,

a plurality of internal preset switches each of which corresponds to one of said plurality of internal memories,

an internal memory read means responsive to the actuation of said plurality of internal preset switches whereby the contents of an internal memory corresponding to an actuated internal preset switch is read into said panel memory means,

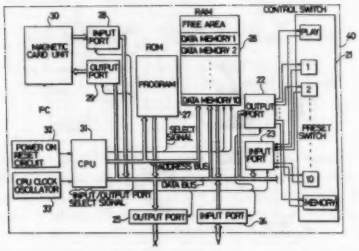
a plurality of external preset switches each of which corresponds to one of said plurality of external memories,

a play switch means for generating a request signal,

an external memory switch means for generating an external memory write signal,

an external memory write means responsive to the actuation of said plurality of external preset switches whereby the contents of said panel memory means is stored into one of said plurality of external memories corresponding to an actuated external preset switch if said external memory write signal is generated,

a card reader means for reading data from a memory card in response to a card read signal and for storing data in a memory card in response to a card write signal,



a memory transfer means responsive to the actuation of said plurality of external preset switches whereby in response to said card read signal the data read from said memory card is stored in one of said plurality of external memories corresponding to an actuated external preset switch and whereby in response to said card write signal the data stored in one of said plurality of external memories corresponding to an actuated external preset switch is stored in said memory card,

an external memory read means responsive to the actuation of said plurality of external preset switches whereby the contents of an external memory corresponding to an actuated external preset switch is read into said panel memory means if said request signal is generated, and

utilization means responsive to the data stored in said panel memory means whereby musical tones are generated corresponding to the stored set of switch states for a setting of said plurality of panel tone control switches.

4,512,231

VIOLIN CONSTRUCTION

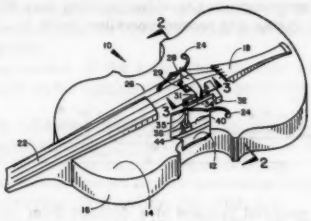
Paul K. Mink, 575 E. Ave. East, Wendell, Id. 83355

Filed Mar. 14, 1984, Ser. No. 589,594
Int. Cl.³ G10D *3/02*
U.S. Cl. 84—277 **5 Claims**

1. An acoustical instrument in which the back and belly of the instrument are allowed to vibrate independently, comprising the combination of:

a hollow body having a back, a belly, and sides, said sides connecting said back to said belly; and

a bridge having two feet, one of said feet supported by and resting on the belly, the other of said feet supported by a bridge stabilizer, one end of said bridge stabilizer forming a portion of the belly, the other end of the bridge stabilizer



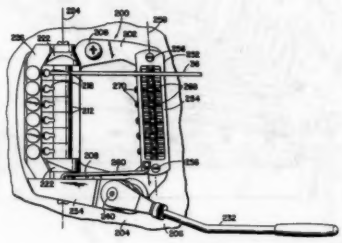
mounted to the upper end of a sound-post, said sound-post extending from said belly to said back.

4,512,232

TREMOLO TAILPIECE AND BRIDGE DEVICE

Helmut F. K. Schaller, Postfach 1225, D-8501 Feucht, Fed. Rep. of Germany

Filed Jan. 13, 1983, Ser. No. 457,748
Int. Cl.³ G10D *3/12*
U.S. Cl. 84—313 **33 Claims**



1. A tremolo tailpiece and bridge device for use with a guitar or similar stringed instrument, said device comprising:

a plurality of string anchor means, one for each of the strings of the instrument,

means supporting said plurality of string anchor means adjacent the top surface of an instrument body at a location near the bottom end of the instrument and for rotational movement relative to said body about a common first axis extending generally transversely to the strings of the instrument and parallel to the top surface of the instrument's body,

a bridge unit having means for engaging all of the strings of the instrument,

means supporting said bridge unit adjacent said top surface of the instrument body some distance away from said plurality of string anchor means in the direction toward the neck of the instrument and for rotational movement relative to said body about a second axis extending generally parallel to said first axis, and

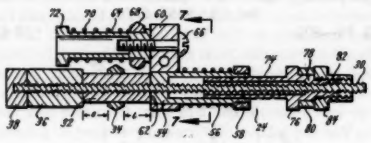
means manually operable by the player of the instrument for synchronously rotating said plurality of string anchor means back and forth in unison about said first axis and said bridge unit back and forth about said second axis, said rotating means including linkage means other than said strings for coupling said string anchor means to said bridge unit.

4,512,233

PITCH ADJUSTER

Jack O. Holland, 2722 Brentwood Blvd., St. Louis, Mo. 63144

Filed Nov. 18, 1983, Ser. No. 552,923
Int. Cl.³ G10D 9/00
U.S. Cl. 84—394 11 Claims



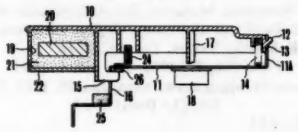
1. In a pitch adjuster for a valved brass instrument, said valved brass instrument having a tuning slide crook telescopically mounted to stationary tube members, said pitch adjuster having means to selectively operate the tuning slide crook between a normal position, preselected inward position, and preselected outward position to raise or lower the note played, and means to automatically restore the tuning slide crook to the normal position, the improvement comprising positive detent means at the normal position, said detent means having stopping means to limit the automatic restoring means to prevent overtravel of said crook upon return to the normal position from either the outward or inward position.

4,512,234

KEYBOARD DEVICE HAVING CUSHIONED WEIGHT MEMBER FOR ELECTRONIC MUSICAL INSTRUMENT

Shinji Kumano, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 25, 1983, Ser. No. 460,954
Claims priority, application Japan, Jan. 26, 1982, 57-10450
Int. Cl.³ G10C 3/12
U.S. Cl. 84—433 16 Claims



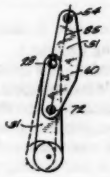
1. A keyboard device of an electronic musical instrument comprising a plurality of keys each mounted on a frame to be tiltable in the vertical direction between a predetermined upper rest position and a predetermined lower rest position; biasing means for resiliently biasing each of said plurality of keys to its predetermined upper rest position; a weight member incorporated in each of said plurality of keys for adding a predetermined weight to each of said plurality of keys; and a cushion means disposed in each of said plurality of keys for elastically suspending said weight member from each of said plurality of keys toward said predetermined upper rest position and toward said predetermined lower rest position of each of said plurality of keys, said cushion means retarding both an action of each of said plurality of keys against said weight member at the start of key depression and a reaction of said weight member against each of said plurality of keys at the end of key depression.

4,512,235

STRESS LIMITED CARTRIDGE RELOADING PRESS

Richard J. Lee, 3146 Kettle Moraine Rd., and John D. Lee, 3086 Kettle Moraine Rd., both of, Hartford, Conn. 53027

Filed Dec. 22, 1983, Ser. No. 564,182
Int. Cl.³ F42B 33/02
U.S. Cl. 86—23 11 Claims



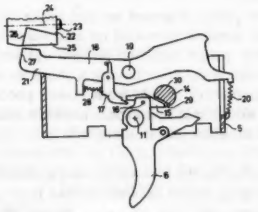
1. A cartridge case reloading press comprising:
a frame including a member for supporting a die,
a ram for retaining a case and guided for travelling reciprocally toward and away from said member,
toggle links pivotally connected to each other and respectively pivotally connected to said frame and said ram, and a manual operating arm connected to one of the links and swingable in one direction to pivot the links toward the position at which said links could toggle and drive said ram sufficiently far for the ram to apply maximum force to said member through the agency of a case, and swingable in an opposite direction to drive the ram away from said member, and
means for stopping the pivotal motion of said links when said arm is being swung in said one direction before said links reach said toggling position to thereby prevent said toggling and prevent imposing said maximum force on said member.

4,512,236

SOUND DAMPENED AUTOMATIC HAND FIREARM

Paul Thevis, Oberndorf, and Helmut Danner, Sulz-Sigmarswangen, both of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,596
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131264
Int. Cl.³ F41D 11/06
U.S. Cl. 89—128 11 Claims



1. A sound dampened automatic hand firearm of the type provided with silencing means for the firing of projectiles at a muzzle velocity in the subsonic speed range,
said firearm comprising a breechblock movable in a predetermined direction between closed and open positions,
said breechblock having abutment means,
a locking lever swingable into engagement with said abutment means for locking said breechblock in its closed

position during the release of a shot to prevent opening movement of the breechblock by the shot,

said locking lever being pivotable about an axis oriented transversely to the direction of movement of the breechblock,

a spring biasing said locking lever toward an unlocking position in which said lever is out of the path of said abutment means to provide for the manual opening of said breechblock,

a trigger swingable between an initial position and a pulled position for releasing a shot,

and a catch connected to and pivotally mounted on said trigger and operable by swinging movement of said trigger toward said pulled position thereof for swinging said locking lever into a locking position with said locking lever engaging said abutment means and for maintaining said locking lever in said locking position as long as said trigger is in its pulled position,

said catch being operative to swing said locking lever to its locking position against the biasing action of said spring,

whereby said catch and said locking lever are operative to prevent movement of said breechblock away from its closed position by the release of a shot.

4,512,237

TANDEM TYPE BRAKE POWER SERVO BOOSTER

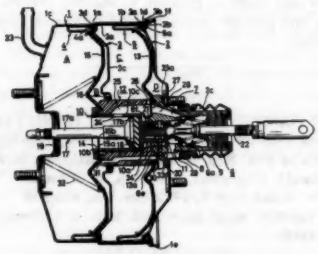
Kazunori Endoh, and Haruo Suzuki, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Japan

Filed Jan. 5, 1983, Ser. No. 455,639

Claims priority, application Japan, Jan. 16, 1982, 57-4141[U]; Jan. 26, 1982, 57-9029[U]; Jan. 26, 1982, 57-10314

Int. Cl.³ F15B *9/10*; F01B *19/00*

U.S. Cl. 91—369 A **13 Claims**



1. A tandem type brake power servo booster, comprising:

a valve body;

a rear power piston disposed on said valve body;

a cylindrical member provided on said valve body;

a front power piston disposed on said cylindrical member, said cylindrical member having a shoulder engaged with an inner periphery of said front power piston;

a nut fitted about said cylindrical member and cooperating with said shoulder and holding said front power piston in position;

a first engaging means located on said cylindrical member;

second engaging means located on said front power piston for engaging said first engaging means to connect said cylindrical member and said front power piston in such a manner that said cylindrical member and said front power piston are prevented against rotating relative to one another when said nut is tightened; and

wherein said cylindrical member further comprises a metallic reaction disk hub having a reduced diameter portion slidably fitted within a central portion of said valve body and also comprises a center body slidably fitted about said hub.

4,512,238

HYDRAULIC DISTRIBUTOR WITH A REACTION BIASED CONTROL MEMBER

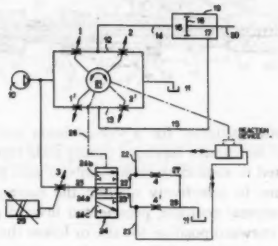
Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Jan. 10, 1983, Ser. No. 457,091

Claims priority, application Spain, Jan. 14, 1982, 509.159

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—370 **15 Claims**



1. A hydraulic distributor for a servo-mechanism, more particularly for a power-assisted steering system of an automotive vehicle, comprising a primary member and a secondary member defining mutually distribution valve means selectively modulable upon a limited relative displacement of said primary and secondary members on both sides of a central position, said primary member being connected to an input actuating member and to a reaction device hydraulically actuated by externally modulated reaction pressures, said secondary member being connected to a driven mechanism coupled to a hydraulic assistance device controlled by the distributor, characterized in that the reaction device has a pair of fluid inlets each connected respectively to an independent fluid flow circuit extending from a corresponding outlet of OR logic function valve means which is actuated by said primary member to which said OR logic function valve means is positively coupled, the OR logic function valve means becoming operative before the distribution valve means of the distributor becomes operative.

4,512,239

VEHICLE AIR DUCT CONSTRUCTION USING CENTER CONSOLE BOX

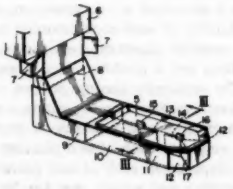
Toshimitu Watanabe; Masayuki Sakai; Kazutoshi Minami, and Shigeji Takumi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 25, 1983, Ser. No. 460,791

Claims priority, application Japan, Jan. 29, 1982, 57-11170[U]

Int. Cl.³ B60H *1/24*

U.S. Cl. 98—2.03 **4 Claims**



1. An air duct for a vehicle, said vehicle having longitudinally arranged front and rear ends and incorporating a floor, a front instrument panel, an air treatment unit fitted under said instrument panel which provides treated air from an air outlet thereof, a front seating assembly mounted on said floor forming an underneath space defined between said front seating

assembly and including side by side half portions thereof, and a rear seating assembly situated above said floor and defining a rear seating space including side by side half portions thereof, said air duct leading treated air from said air outlet of said air treatment unit to said rear seating space and comprising:

a hollow center console box extending along a transversely central portion of said floor of the vehicle in the longitudinal direction of the vehicle from a front end thereof connected with said air outlet of said air treatment unit to a rear end thereof located at a front side portion of and close to said underneath space so as to define an air flow passage, said center console box having formed therein at said rear end portion thereof first and second outlet openings opening respectively toward said side by side half portions of said underneath space so as to respectively supply flows of air principally to said side by side half portions of said rear seating space through said side by side half portions of said underneath space;

first damper means positioned in said center console box for controlling flow resistance of said air flow passage formed therein; and

second damper means of a single plate member type positioned in said center console box at a transversely central portion thereof for variably dividing a flow of air flowing through said air flow passage into said flows of air supplied through said first and second air outlet openings, respectively.

4,512,240

DOOR, PARTICULARLY FOR A CAR

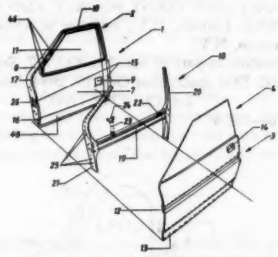
Gert Mahler, Radevormwald; Heinz-Jürgen Falkenroth, Ennepetal; Wulf Leitermann, Wimpfen, and Manfred Boms, Neckargerach, all of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jun. 1, 1983, Ser. No. 499,828

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221322

Int. Cl.³ B60H *1/26*

U.S. Cl. 98—2.04 **25 Claims**



1. A door for a car or the like vehicle, said door having:

an inner section directed toward the inside of the car; the door inner section being formed of plastic said inner section comprising a generally box-shaped lower part, with an open side which opens toward the outside of the car; a window frame integral with said lower part of the door inner section; the window frame being comprised of arms extending up from the lower part of the inner section;

said door having an outer section located outside the said inner section; the door outer section also being formed of plastic at its outer side, the door inner section being attached to the inner side of the door outer section;

a window pane at the door outer section firmly attached to the arms of the window frame; the said arms of the window frame having a U-shaped cross-section with the open side of the U facing toward the door outer section, the window pane extending across the open side of the U and closing off the U for defining a stiffening structure thereby.

21. The door of claim 1, further comprising an air duct between the door inner and outer sections, which duct is connectable with an air supply; the duct extending generally rearwardly along the door; an outlet from the duct and directed for blowing air against the window pane.

4,512,241

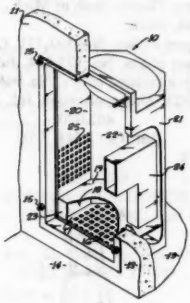
PLENUM/VACUUM CHAMBER WITH DUCT CONNECTION FOR INSTALLATION IN CABINET OF FIXTURE TO CONTROL AIR SUPPLY OR RETURN

Earl L. Morris, La Habra Heights, and V. Walter Hafner, Whittier, both of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 5, 1983, Ser. No. 455,751

Int. Cl.³ F24F *13/00*

U.S. Cl. 98—32 **10 Claims**



1. A plenum/vacuum chamber for providing air circulation to a room comprising:

a hollow housing securely affixed over an opening in the wall of a room, said housing extending into said room;

a first grille formed in a wall of said housing, said grille being formed from a plurality of openings formed through a portion of the wall said grille having an exterior surface and an interior surface; and

a second grille formed in a wall of said housing other than the wall of the housing in which said first grille is formed said second grille having an air-tight compartment sealingly affixed about the interior surface thereof, said compartment having an opening for connection to an air supply-return.

4,512,242

HEAT DESTRATIFICATION METHOD AND SYSTEM

Hoy R. Bohanon, Sr., Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corp., Muskogee, Okla.

Filed Jun. 11, 1982, Ser. No. 387,679

Int. Cl.³ F24F *7/06*

U.S. Cl. 98—31.5 **7 Claims**

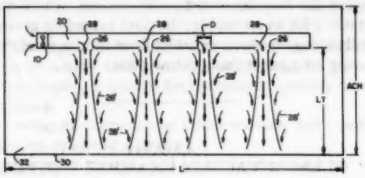
1. A method of destratifying heat within an enclosure, comprising:

drawing warm inside air off of the ceiling of the enclosure,

propelling the warm inside air from the ceiling along a confined path that is separate from the remaining portions of the air within the enclosure,

jetting the warm air downwardly from the confined path along a plurality of streams to the vicinity of the floor of the enclosure, and

entraining quantities of surrounding warm air by the downward movement of each of the jetting streams thereby



moving the surrounding warm air to the vicinity of the floor of the enclosure.

4,512,243

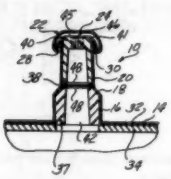
VENTILATOR HAVING INSERT FOR CONTROLLING MOISTURE AND METHOD OF MAKING SAME

James W. Ballard, Livonia, and Larry R. Ballard, Redford Township, Wayne County, both of Mich., assignors to Charles Bonnici, Livonia, Mich.

Continuation-in-part of Ser. No. 193,711, Oct. 3, 1980, , and a continuation-in-part of Ser. No. 172,414, Jul. 25, 1980, Pat. No. 4,370,876, which is a division of Ser. No. 968,192, Dec. 11, 1978, Pat. No. 4,214,513. This application Jul. 23, 1982, Ser. No. 402,020

Int. Cl.³ F24F *7/02*

U.S. Cl. 98—42.01 **28 Claims**



23. A roof ventilator, comprising:

an elongate, essentially hollow tube having a longitudinal passageway therein through which air may flow;

a structurally self supporting, thermally insulative sleeve of foamed synthetic material lining at least a portion of the interior wall of said tube within said passageway, said sleeve including an inside wall exposed to and defining and air space within said passageway which is thermally insulated from said interior wall; and

a generally planar, foraminous member for controlling the flow of moisture in one direction through said passageway, said foraminous member being secured to said sleeve and extending across said air space, whereby all of the air flowing through said passageway passes through said foraminous member.

4,512,244

VENTILATION GRATING FOR USE IN WINDOW FRAMES TOGETHER WITH SEALED UNIT INSULATING GLASS

Jan J. Knaap, Haren, Netherlands, assignor to Kateka B.V., Netherlands

Filed Nov. 23, 1983, Ser. No. 554,601

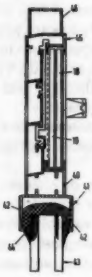
Int. Cl.³ F24F *13/18*

U.S. Cl. 98—98 **6 Claims**

1. A closable ventilation grating for attachment against a head piece of a window frame comprising an upper hollow profile member, a lower hollow profile member both made of a metal, and left and right end members each provided with lugs that may be fittingly pushed into the corresponding ends of the upper and lower profile members to form a rectangular frame, said end members having outwardly directed flat flanges; in the frame further being mounted two grids having similar vent openings one of the grids being slidable along the other in order to control the amount of ventilation; the grids being made of the same material as the left and right end members of the rectangular frame, characterized in that

(a) the lower profile member has been provided with two parallel pending flanges for mounting of the ventilation grating on sealed unit insulating glass;

(b) the upper profile member has been provided with an



upper channel of rectangular inverted U-shape having a thickness corresponding to the thickness of the insulating glass to be used and being located such that the vertical side walls of the U-shaped channel essentially are flush with the inner and outer surfaces defined by the insulating glass;

(c) the end members each have been provided with a profile of basically rectangular cross-section, that may be fittingly pushed on the flat flanges, the cross-sectional width of the profile being equal to the thickness of the insulating glass to be used.

4,512,245

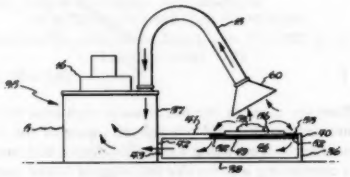
PORTABLE POINT SOURCE ADSORBER

Max Goldman, Latham, N.Y., assignor to Adsorbent Products Inc., Latham, N.Y.

Continuation-in-part of Ser. No. 422,757, Sep. 24, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,942

Int. Cl.³ F24F *11/00*

U.S. Cl. 98—115.4 **18 Claims**



1. A portable point source filter for adsorbing both lighter-than-air fumes and heavier-than-air fumes from a fume emitting specimen comprising a gas-tight box, an exhauster blower mounted on said gas-tight box for exhausting gases from said box, first conduit means in communication with said box for conducting gases into said box, said first conduit means having a first end mounted on said box and a second end for placement above a point source, second conduit means having a first end in communication with said box and a second end for placement below said point source, and adsorbent filter means mounted within said gas-tight box and in communication with said exhauster blower whereby gases passing into said box

from said first and second conduit means must pass through said adsorbent filter means.

4,512,246

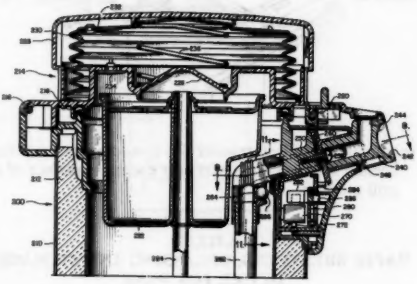
PERCOLATOR INCLUDING PUMP-TYPE DISPENSER

William A. Chappell, Raytown; William J. Tweed, Kansas City, and David T. Higgins, Lee's Summit, all of Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.

Continuation-in-part of Ser. No. 453,787, Dec. 27, 1982, Pat. No. 4,464,983. This application Jul. 10, 1984, Ser. No. 629,351

Int. Cl.³ A47J *31/00*

U.S. Cl. 99—312 **16 Claims**



1. A percolator/dispenser comprising:

an insulated vessel;

a spout extending between the interior and the exterior of the vessel;

a perforated basket inside the vessel;

percolator means for causing a liquid contained in the vessel to percolate through the basket, said percolator means comprising:

a heater; and

a conduit extending upwardly from the heater to conduct the liquid heated by the heater to a portion of the interior of the vessel above the basket;

a manually operated pump mounted to the vessel and operative to pump the liquid out of the spout;

a manually operated venting system comprising vent means for selectively opening and closing a vent path between the interior and the exterior of the vessel; and

interlock means, responsive to the vent means, for automatically disabling the heater when the vent path is closed and for automatically enabling the heater when the vent path is open.

4,512,247

POPCORN POPPING AND COATING APPARATUS

Aaron M. Friedman, 23200 Riverside, Apt. 437, Southfield, Mich. 48034

Filed May 19, 1983, Ser. No. 496,052

Int. Cl.³ A23L *1/18*

U.S. Cl. 99—323.5 **15 Claims**

1. An apparatus for coating popping corn kernels and coating the popped kernels comprising:

a base;

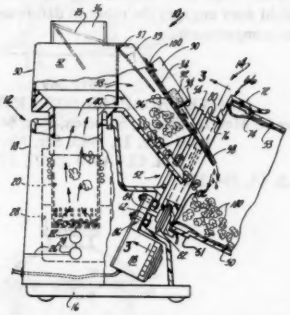
a first housing secured to said base, said housing defining a chamber for holding popping corn kernels and including a means for heating said popping corn kernels to a temperature sufficient to permit kernels of popping corn to pop;

a receptacle;

means secured to said base for supporting and rotating said receptacle;

passage means for transferring popped kernels from said chamber to said receptacle, said passage means comprising a second housing removably secured to said first housing and defining a tubular chute extending between said chamber and said receptacle;

gate means secured to said chute, for normally closing said chute; said gate means comprising means responsive to the volumetric expansion of cooked popping corn to open



said gate means so that popped corn continues to be heated by said heating means until a predetermined accumulation of volumetrically expanded kernels opens said gate and permits passage of said kernels from said chamber to said receptacle.

4,512,248

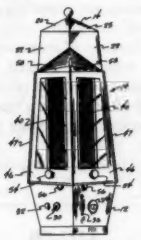
ROTISSERIE COOKER

Dinos G. Volakakis, 6905 Cleaton Rd., Apt. C-1112, Columbia, S.C. 29206

Filed Jan. 23, 1984, Ser. No. 572,853

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—341 **4 Claims**



1. In a rotisserie cooker having a multi-sided base, wall sections attached to and extending upwardly from sides of the base to define with a roof section an open front cooking area, a rotatable spit centrally mounted on the base and extending vertically upward in the cooking area for supporting food to be cooked, and heating means on an inner surface of the wall sections for radiating heat onto food on the spit to heat the same, the improvement therewith comprising door means for closing a major portion of the open front of the cooking area to define with the wall sections a cooking compartment to facilitate the cooking of food and the comfort of personnel in the area of the cooker, said door means comprising a pair of bifold doors, each bifold door having an upwardly extending side panel and an upwardly extending front panel with window to permit viewing of the interior of the cooking compartment, hinge means pivotally interconnecting adjacent upstanding side edges of the side and front panels of each bifold door, and hinge means pivotally connecting the other upstanding side edge of each side panel to a respective wall section of the cooker which defines a side of the opening into the cooking compartment, each panel of each bifold door having a lower

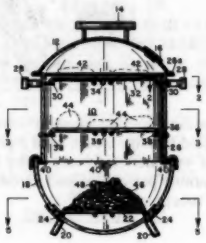
edge for engaging an upper edge of a side of the multi-sided base of the cooker and each front panel having a free upwardly extending side edge for engaging the other front panel side edge to close the front of the cooking compartment opening when the doors are in closed position, and the door panels having upper edges located below the roof section of the cooker when the free side edge of each front panel of each bifold door engages the other to define an upper opening from the compartment.

4,512,249

SMOKER ADAPTER FOR KETTLE GRILLS

Lee R. Mentzel, Rte. 1, Shiocton, Wis. 54170

Filed Apr. 21, 1983, Ser. No. 487,044
Int. Cl.³ A47J *37/07, 37/04*
U.S. Cl. 99—352 **6 Claims**



1. A smoker adapter for use with a kettle grill having a cover and a lower kettle portion each having vents for controlling air flow, comprising:

a vertical cylindrical peripheral wall;

first support means about the top of said wall for supporting the cover of the kettle grill;

second support means for supporting said wall above the lower portion of the kettle grill, said second support means being a plurality of removable clips each having a curved portion which is hooked over the edge of the kettle and an outstanding tab portion extending toward the center of the kettle, upon which tabs said wall rests;

at least one grill rack for supporting the food to be cooked; and

third support means for supporting said grill rack within said peripheral wall.

4,512,250

APPARATUS FOR COOKING EGGS

James C. Schindler, and Donald K. Jewell, both of Naperville, Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Division of Ser. No. 146,438, May 5, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 316,102
Int. Cl.³ A47J *37/10*
U.S. Cl. 99—425 **11 Claims**

1. Apparatus for cooking an egg comprising:

(a) a grill having a grill surface for supporting an egg thereon, said grill including a grill member defining said grill surface on one side and also defining a heat exchange surface on the other side for being heated whereby heat can be transferred from said heat exchange surface through said grill member to said grill surface;

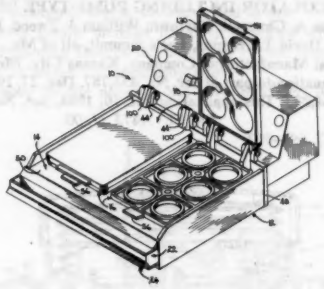
(b) means for heating said grill surface from beneath the grill surface;

(c) a steam containment enclosure adapted to cover said grill surface for defining a steam containment volume thereabove;

(d) means for injecting steam above said grill surface from a source of pressurized steam into said steam containment volume;

(e) said grill further including a steam heating chamber defined in part by said grill member;

(f) wherein said apparatus further includes means for injecting steam into said steam heating chamber; and



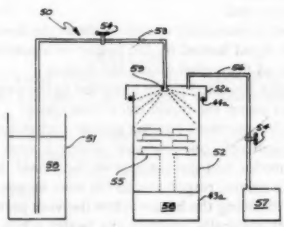
(g) a plurality of heat transfer fins extending into said steam heating chamber from said heat exchange surface of said grill member.

4,512,251

RAPID BREATHING, DEGASSING AND STORAGE DEVICE FOR WINE

Kenneth Green, 24 Reserve Ave., Blaxland, New South Wales 2774, Australia, assignor to Kenneth Green and Graham Edward Thomas, both of Blaxland, Australia

Filed Sep. 30, 1983, Ser. No. 537,981
Claims priority, application Australia, Oct. 1, 1982, PF6152; Jan. 24, 1983, PF7719
Int. Cl.³ A23B *7/00*
U.S. Cl. 99—472 **4 Claims**



1. Apparatus for degassing or breathing of fermented wine contained in a first container, said apparatus comprising:

a second container having an opening, a container closure, seal means for engaging said container closure over said opening of said second container, a first aperture and a second aperture, each opening to said second container,

a vacuum source being fluidly connected to an upward location in said second container through said first aperture so as to provide evacuation of gases from said second container therethrough,

an elongated fluid passage with one end passing through said second aperture and the other end adapted for establishing fluid communication with wine in said first container, whereby upon evacuating said second container, wine from said first container is drawn through said fluid passageway into said second container, and

a spray device on the end of said fluid passage at an upward location within said second container so that the wine entering therethrough forms a spray or fine mist, whereby the entering wine presents a large surface area from which gas is efficiently extracted under reduced pressure even in

the absence of heating which would adversely affect the quality of the wine.

4,512,252

BALING PRESS

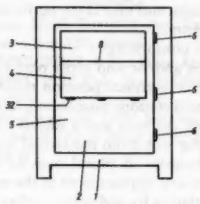
Albert Goldhammer, Überlingen, Fed. Rep. of Germany, assignor to Firma Feinwerktecnik Schleicher & Co., Markdoff, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,478

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112914

Int. Cl.³ B30B *15/00*

U.S. Cl. 100—53 **12 Claims**



1. A baling press apparatus comprising:

a press frame having a working chamber area;

a press door movably fastened to said press frame for providing access to said working chamber area;

a feed opening in said apparatus enabling material to be baled to be inserted into said working chamber area so as to be pressed in said working chamber area;

a feed door provided at said feed opening, being movable for opening and closing of said feed opening;

the feed door being divided into upper and lower door parts by a horizontal partiion line; and said

upper door part being directly connected to said lower door part by drive means for actuating said upper door part in response to actuation and movement of said lower door part.

4,512,253

APPARATUS FOR PROCESSING RECYCLABLE CONTAINERS

Robert L. La Barge, Ben Avon; Eric D. Arndt, New Kensington; Jerrold D. Green, Murrysville, all of Pa.; Ronald G. Hawkins, Massena, N.Y.; Frank J. Horansky, Apollo; Charles J. Leftault, Jr., Murrysville, both of Pa.; Elmer E. Pohlenz, Richmond, Ind., and Thomas W. Scherf, Vandergrift, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,425

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—53 **25 Claims**

1. Apparatus for receiving and crushing containers consisting essentially of recyclable material comprising:

(a) an enclosure;

(b) a manually operated rotatable carrier associated with said enclosure;

(c) a first station comprising a pocket in said carrier to receive a container;

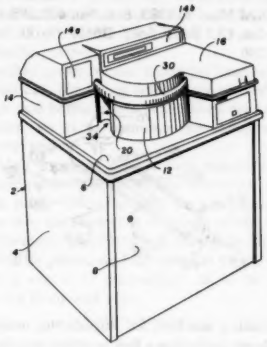
(d) means for detecting the presence of a container in said pocket;

(e) means for determining the orientation of said container within said pocket;

(f) latching means to prevent rotation of said rotatable carrier until a container inserted therein has passed all tests performed in said first station;

(g) means for detecting the type of material comprising the walls of said container;

(h) means for measuring the weight of said container; and



(i) means for crushing metallic containers having a predetermined acceptable weight.

4,512,254

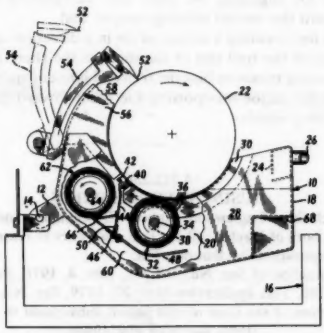
FOAM INK FOUNTAIN

Leif F. Reslow; Mark D. Nieman, and Dean R. Swagert, all of York, Pa., assignors to Motter Printing Press Co., York, Pa.

Filed Apr. 24, 1984, Ser. No. 603,507

Int. Cl.³ B41F *9/10, 9/16;* **B41L** *27/08*

U.S. Cl. 101—157 **5 Claims**



1. A fountain for applying a foam ink to an engraved cylinder of a rotogravure printing press comprising

an open ink pan disposed below the engraved cylinder,

means for supplying the foam ink to the ink pan,

rotary brush means for applying foam ink from the ink pan to the engraved cylinder,

a pre-doctor blade disposed in adjacent spaced relation to the engraved cylinder and arranged, in the direction of rotation thereof, following the rotary brush means, the pre-doctor blade permitting a predetermined amount of foam ink to pass thereby,

a doctor blade bearing against the engraved cylinder for scraping excess ink therefrom, the doctor blade being arranged, in the direction of rotation of the engraved cylinder, spaced from and following the pre-doctor blade, and

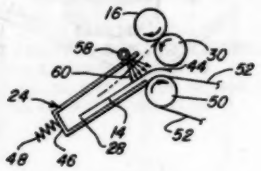
pump means for moving foam ink from the space between the pre-doctor blade and the doctor blade to the rotary brush means.

4,512,255

SHEET HANDLING MECHANISM FOR DUPLICATING MACHINE WITH DUPLEXING CAPABILITY

Lee D. Crist, Burlingame, Calif., assignor to AM International, Chicago, Ill.

Filed Mar. 4, 1983, Ser. No. 472,393
Int. Cl.³ B41F 5/02; B65H 29/00
U.S. Cl. 101—230 **10 Claims**



1. In a duplicating machine for duplicating images on both sides of copy sheets including a first printing couple, having an impression cylinder, for transferring a first image to a first side of a copy sheet and a second printing coupled for transferring a second image to a second side of the sheet, means for handling said sheets for duplexing said images thereon, comprising:

means for directing each sheet issuing from said impression cylinder in a path away from the first printing couple;

means for diverting each sheet out of said path toward a reversing station;

means at the reversing station for re-feeding each sheet back into the path;

means for engaging the sheet and transporting the sheet toward the second printing couple; and

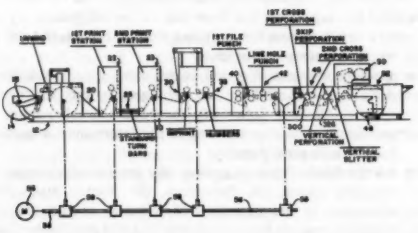
means for directing a stream of air in a direction against the plane of the trail end of the sheet as the sheet leaves the diverting means to bias the trail end into engagement with said means for transporting the sheet toward the second printing couple.

4,512,256

BUSINESS FORMS PRESS

Louis Schriber, Englewood; Robert E. Stephens, and John F. Blaha, both of Dayton, all of Ohio, assignors to Harris Graphics Corporation, Melbourne, Fla.

Continuation of Ser. No. 738,751, Nov. 4, 1976, Pat. No. 4,177,730. This application Nov. 27, 1979, Ser. No. 97,622
The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.
Int. Cl.³ B41F 5/08, 13/14
U.S. Cl. 101—248 **6 Claims**



1. In a web printing press for printing business forms, including

an unwind station having a mechanism for supporting a roll of web material within a range of adjustment width-wide of said press,

at least one print station having means including rotary cylinders for printing form information on the web,

a numbering station including numbering machine means operable to print a number on each of the printed forms,

a a punch station including marginal punch unit means for forming a series of marginal holes along the printed forms,

a cross perforator station including rotating perforating blade means for making a transverse discontinuous line of perforation across the printed web for separation of the individual forms,

a drive connected to said stations to withdraw the web material from the roll and to rotate said cylinders and operate said numbering machine means, said marginal punch unit means, and said cross perforating blade means all in synchronsim:

the improvement comprising

said punch station and/or said cross perforator station having a rotary zero reference position relative to said drive,

means at one of said stations establishing a lateral zero reference position of the web and a means for indicating displacement of the web from the lateral reference position,

adjustment mechanisms at plural ones of said stations for adjusting the rotary displacement of the means included in said stations relative to said rotary reference position,

adjustment mechanisms at plural ones of said stations for adjusting the lateral displacement of the means included in said stations relative to said lateral reference position,

and coordinated indicated means coupled to each of said adjustment mechanisms to indicate the respective lateral or rotary zero positions and the respective lateral or rotary adjustments,

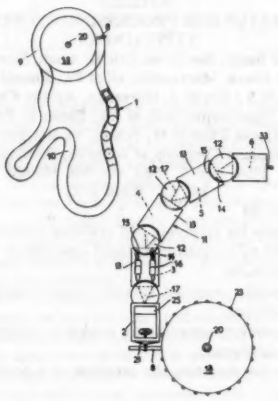
said adjustment mechanisms and indicator means constituting a coordinate layout system enabling precise alignment of each of said stations of the press from coordinate instructions at the beginning of makeready of the press.

4,512,257

CAROUSEL AND TRAIN FOR AMUSEMENT PARKS

Paul Loisel, 46 Vieux chemin de Paris, 95290 L'Isle Adam, France

Filed Apr. 29, 1982, Ser. No. 373,178
Claims priority, application France, May 5, 1981, 81 08859
Int. Cl.³ A63G 1/00, 25/00
U.S. Cl. 104—53 **9 Claims**



1. An amusement park ride system, comprising:

a track, said track being a closed continuous first loop;

a complex path of travel forming a closed second loop, said complex path including a portion of said first loop;

an automotive train having at least one car, said train being adapted to move on said track and said path;

first and second connecting portions between said track and path, at said first connecting portion said train being selectively subject to one of egressing from said track to said path and continuing movement on said track, at said second connecting portion said train returning from said path to said track; and

steering means for selecting at said first connecting portion either said track or said path for movement thereon of said train.

4,512,258

HIGH SPEED UNDERGROUND TRANSPORTATION SYSTEM

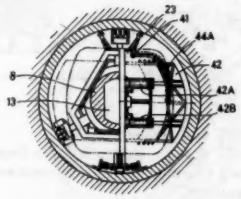
Kosuke Matsukata, 23-18 Toyooka-cho, Tsurumi-ku, Yokohama-shi, Kanagawa-ken 230, Japan

PCT No. PCT/JP82/00347, § 371 Date Jan. 7, 1983, § 102(e) Date Jan. 7, 1983, PCT Pub. No. WO84/00932, PCT Pub. Date Mar. 15, 1984

PCT Filed Aug. 30, 1982, Ser. No. 460,246

Int. Cl.³ B61B *13/10;* **B61F** *9/00;* **B64C** *9/32*

U.S. Cl. 104—138 R **1 Claim**



1. In an underground high speed transportation system of the type comprising an underground tube, at least one car running in said underground tube, at least two sets of legs of said car, each set having three legs positioned symmetrically around and radiating from an axis coaxial with the axis of the tube, a frame unit connecting said legs, a driving wheel on the extreme end of each of two said legs and a freely rotatable wheel on the extreme end of the third said leg, said two driving wheels lying on an imaginary horizontal line spaced between the bottom of the tube and the middle of the tube and said two driving wheels being in contact with the inner surface of the tube, and driving motors coupled to said driving wheels and driving said wheels for driving said car along said tube, wherein each said leg is extendable and retractable and each has an end part telescopically mounted on a main part, and said end and main parts define between them a hydraulic chamber, and a hydraulic control system coupled to the hydraulic chambers for extending said end parts of said legs, an improved means on said car for providing vertical stability, said stabilizing means comprising:

(a) one radiating spoke fixed to a central axle of the car extending toward the middle of the lower circumference of the tube, adjacent to and spaced from said tube, equipped with an even number of extendably mounted stabilizing wheels, transversely mounted to opposite sides of said spoke, two planar surfaces that contact the treads of said stabilizing wheels, between which said stabilizing wheels travel as the car moves through said tube;

(b) means for providing outward pressure to said stabilizing wheels to assure that they remain in contact with said planar surfaces as the car travels through the underground tube, said pressure means including a system of hydraulic cylinders to which each stabilizing wheel is extendably mounted and a regulated hydraulic pressure source to provide controlled hydraulic pressure to said hydraulic cylinders for pressing the stabilizing wheels outwardly against the planar surfaces; and

an improved baffle-type braking system comprising:

(a) flat baffle plates;

(b) baffle plate control means for extending and retracting said baffle plates whereby said baffle plates may be pushed outward from the body of the car to provide wind resistance for the purpose of decelerating said car, said baffle plates control means including two hydraulic cylinders per baffle plate and a regulated source of hydraulic pressure;

(c) movable cover means, mounted flush with the outside of said car, for being selectively moved into place to cover said baffle plates when they are in the retracted position, so as to maintain the aerodynamics of said vehicle; and

(d) a high pressure air ejection means including ports located on both the posterior and anterior sides of said baffle plates for exhausting high pressure air from said ports into the direction of travel of the vehicle during deceleration, thereby augmenting the braking force of said baffle plates, said air ejection means being supplied with a source of pressurized air to be selectively exhausted from said ports.

4,512,259

AUTOMATIC TRANSPORT SYSTEM COMPRISING CABLE-DRAWN NON-MOTORIZED VEHICLES

Jean Huon de Kermadec, Versailles, France, assignor to Soule Fer et Froid S.A., Bagneres de Bigorre, France

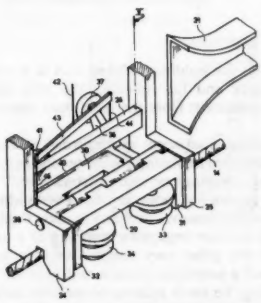
PCT No. PCT/FR81/00015, § 371 Date Oct. 6, 1981, § 102(e) Date Oct. 6, 1981, PCT Pub. No. WO81/02275, PCT Pub. Date Aug. 20, 1981

Continuation of Ser. No. 309,888, Oct. 6, 1981, abandoned. This PCT application Feb. 9, 1981, Ser. No. 583,277

Claims priority, application France, Feb. 11, 1980, 80 02908

Int. Cl.³ B61B *9/00, 12/12*

U.S. Cl. 104—208 **14 Claims**



1. An automatic transport system comprising:

a plurality of non-motorized vehicles supported for rolling movement on a closed-circuit support and guide track, said track having a main section for high speed movement of said vehicles and a station section adjacent to an end of said main section for decelerating said vehicles, said station section having an entrance and an exit;

a drive cable continuously moving in a closed circuit defined by a set of rollers for pulling said vehicles over said main section of said track, each of said vehicles having automatic coupling means for coupling the said vehicle to said drive cable, said coupling means comprising

a two-branch clamp for embracing said cable, each of said branches comprising a fixed member mounted on the chassis of said vehicle, and a revolving member mounted on said fixed member; and

means for automatically applying a predetermined clamping force to said cable, at least one branch of said clamp having means for opposing the movement of said revolving member relative to said fixed member with a force proportional to said predetermined clamping force, whereby upon closing said clamp said revolving member rolls without slip relative to said cable and revolves relative to said fixed member, said means for opposing the movement of said revolving member limiting the value of acceleration of said vehicle to a predetermined value so that the vehicle gradually attains the speed of said drive cable;

means located at the entrance to said station section for automatically opening said clamp;

means for automatically decelerating and transporting said vehicles between the entrance and the exit of said station section; and

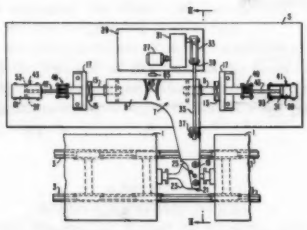
means at the exit from said station section for automatically closing said clamp to attach said vehicles to said cable.

4,512,260

TRAIN HOLDING APPARATUS WITH MEANS FOR RELIEVING THE LOAD IMPOSED THEREON DURING DISENGAGEMENT

Edward T. Manning, Jr., and Grant S. Horan, both of Bay Village, Ohio, assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 427,003
Int. Cl.³ B61B *12/00*; B61J *3/00*; B61K *7/16*
U.S. Cl. 104—252 **8 Claims**



1. Apparatus for holding railroad cars in a train in place on a railroad track and for relieving the load carried thereby during disengagement from the train, said apparatus comprising:

a base positioned adjacent said railroad track;

a car holding arm including means on one end of said arm for engaging couplings on said railroad cars;

mounting means for mounting the car holding arm on the base for movement between a car engaging position wherein the arm engages a coupling of a car to hold that car and any other cars coupled to it in position on the track, and a retracted position wherein the cars are movable along the track relative to said car holding arm, said mounting means including means providing for movement of said car holding arm in a direction parallel to the direction of said track;

thrust absorbing means connected to said car holding arm for selectively resisting movement of the arm in a direction parallel to the railroad track; and

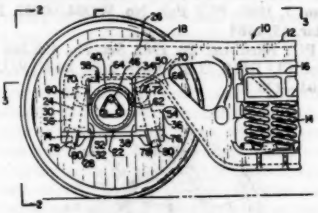
control means for selectively conditioning said thrust absorbing means to resist movement of the car holding arm in said direction parallel to the direction of said track in response to loads imposed thereon by the cars when the arm is in engagement with the coupling on a railroad car to hold the cars in place on the track, and for conditioning said thrust absorbing means to permit movement of the car holding arm in a direction parallel to the railroad track to relieve the load imposed by said cars on said car holding arm when the car holding arm is to be moved to the retracted position, whereby the car holding arm can be moved from engagement with the car coupling for return to the retracted position without any load from the cars being imposed therein.

4,512,261

SELF-STEERING RAILWAY TRUCK

Oscar J. Horger, San Diego, Calif., assignor to A. Stucki Company, Pittsburgh, Pa.

Continuation of Ser. No. 390,220, Jun. 21, 1982, abandoned.
This application Sep. 30, 1982, Ser. No. 429,004
Int. Cl.³ B61D *3/08*, *5/26*, *5/38*
U.S. Cl. 105—167 **13 Claims**



1. A railway truck comprising:

a pair of laterally spaced, elongated side frame members having opposed openings therein intermediate the length thereof; respectively,

at least one elongated rotatable axle extending transversely between said side frame members with the ends thereof being received at least in part within said openings, respectively;

rotatable wheels carried by said axle adjacent the ends thereof laterally inward of said side frame members, respectively;

said axle having axially spaced and circumferentially extending bearing areas located outwardly adjacent said wheels and said openings, respectively;

side frame support members engageable by upwardly facing portions of said bearing areas, respectively, for continuous support thereof;

each of said side frame support members carrying longitudinally spaced upper support means;

said upper support means including upwardly facing engagement surface portions which are fixedly located with respect to said side frame support members, respectively, generally outwardly in longitudinally opposite directions with respect to a vertical plane passing through the axis of rotation of said axle;

each of said side frame members carrying longitudinally spaced lower support means;

said lower support means including downwardly facing engagement surface portions which are fixedly located with respect to said side frame members, respectively, outwardly in opposite directions with respect to such a vertical plane;

said downwardly facing engagement surface portions being spaced a greater longitudinal distance from such vertical plane than the respective said upwardly facing engagement surface portions to provide a pair of longitudinally offset upper and lower engagement surface portions on each side of such vertical plane adjacent each end of said axle;

and rigid connecting means having fixedly spaced apart, oppositely facing surfaces thereon which are engageable with respective said pairs of upper and lower engagement

surface portions to connect said upper and lower support means, respectively, in a manner to permit simultaneous relative lateral and longitudinal movement of said members in response to the relative lateral and longitudinal movement of said wheels and said axle with respect to said side frame members while maintaining continuous engagement with said upper and lower engagement surface portions.

4,512,262

ARTICLE DISPLAY STAND

Wolf-Dietrich Hannecke, Rischenau Weg 6, 3410 Northeim, Fed. Rep. of Germany

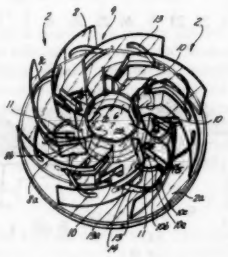
Continuation-in-part of Ser. No. 821,410, Aug. 3, 1977,. This application Dec. 14, 1981, Ser. No. 330,771

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 7706489[U]; Mar. 3, 1977, 7706490[U]; Mar. 4, 1977, 7706706[U]

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.[3] **A47B** *57/00*

U.S. Cl. 108—61 **18 Claims**



1. The article display stand comprising an elongated upright resiliently deformable support having a plurality of recesses which are spaced from and located adjacent to each other in the direction of elongation of said support; and an article supporting element mountable in said support in any of a plurality of positions spaced longitudinally of said support and having a projection which is detachably engageable with respective ones of said recesses so that, when said projection of said article supporting element engages in one of said recesses of said support, said article supporting element is fixed in a respective one of said positions, said article supporting element including a substantially horizontal base plate arranged to support articles and a substantially upright hollow conical member connected with said base plate and fittable onto said support, said conical member having an upper region and a lower region, said article supporting element having a second such projection upwardly spaced from said first-mentioned projection, said first-mentioned projection being arranged in said lower region of said conical member whereas said second projection is arranged in said upper region thereof.

4,512,263

DEPOSITORY APPARATUS WITH SEQUENTIAL STACKING

Frederick E. Lanning, Concord, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1983, Ser. No. 492,321

Int. Cl.[3] **E05G** *1/00, 5/00*

U.S. Cl. 109—66 **6 Claims**

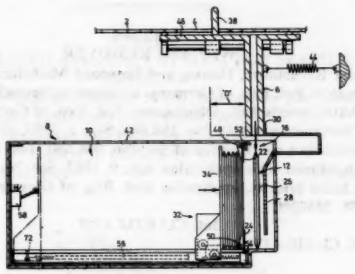
1. An improved depository apparatus, for use in an automatic banking system or the like, comprising:

housing means having a deposit aperture formed therein:

a substantially closed depository storage chamber within said housing means, said chamber having an access port displaced relative to said deposit aperture;

an open-ended duct member mounted within said housing means for movement between a first position for communication solely with the storage chamber access port, and a second position for communications solely with said deposit aperture;

operating means effective to provide for movement of said duct member between said first and second positions;



said depository storage chamber having a receiving zone in communication with said access port, and a storage zone;

gate means mounted between said receiving zone and said storage zone to permit one-way passage of deposits from said receiving zone to said storage zone; and,

pusher means mounted in said housing means for movement responsive to operation of said duct member to push a deposit located in said receiving zone through said gate means and into said storage zone to thereby effect sequential stacking of deposits.

4,512,264

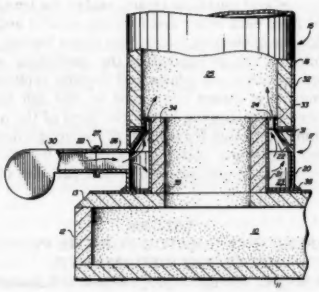
INDUCED STACK DRAFT APPARATUS

James P. Crawford, P.O. Box 13243, Orlando, Fla. 32859

Filed Oct. 31, 1983, Ser. No. 546,992

Int. Cl.[3] **F23L** *17/16;* **F23N** *3/00*

U.S. Cl. 110—160 **4 Claims**



1. An induced draft apparatus comprising in combination:

a combustion chamber;

an exhaust stack operatively connected to said combustion chamber;

induced draft means attached between said combustion chamber and said exhaust stack around the base of said exhaust stack and having an annular plenum formed of mild steel, an air blower connected to said annular plenum for directing air under pressure into said annular plenum and out a narrowed annular opening into said stack,

whereby the velocity of the air leaving said annular plenum is increased as it exits into said stack;

an annular refractory surface formed on the inside of the inside wall of said plenum wall and abutting refractory material in the combustion chamber, whereby said plenum wall is protected from heat and exhaust gases passing through said stack; and

said induced draft means having a reinforced annular ledge having an annular lip therearound for attachment of the base of a stack lined with a refractory material thereon.

4,512,265

WET ASH REMOVER

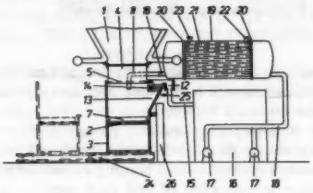
Horst Buchmüller, Hünxe, and Bernhard Michelbrink, Wesel, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 182,862, Sep. 2, 1980, abandoned, which is a continuation of Ser. No. 006,580, Jan. 26, 1979, abandoned. This application Apr. 9, 1982, Ser. No. 366,789

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830380

Int. Cl.³ F23J *1/02*

U.S. Cl. 110—171 **8 Claims**



1. A wet ash remover comprising: a trough arranged underneath the ash funnel of a boiler; said trough being filled with quenching water; a quenching water feed means and an overflow means located on said trough; ash conveying means passing through said trough; cooling means located between said overflow means and said quenching water feed means for cooling said quenching water, quenching water being continuously circulated through said cooling means, said quenching water being cooled by a coolant isolated from said quenching water in said cooling means; and at least one set of a plurality of immovable parallel plates located inside said trough immediately in front of said overflow means, said plates being inclined and spaced from each other and forming parallel and inclined passages for the quenching water, said plates having means so that particles of ash suspended in the quenching water are precipitated between said plates and thereby retained in said trough; immersion means connected to said ash funnel and having lower edges dipping below the level of the quenching water within said trough for sealing off the trough from the ash funnel, said quenching water being cooled by said cooling means subsequent to precipitation of said particles of ash.

4,512,266

CITY REFUSE INCINERATOR FOR THE PREVENTION OF CLINKER FORMATION

Masanobu Shigaki, Ibaragi, Japan, assignor to Kabushiki Kaisha Takuma, Osaka, Japan

Filed Mar. 27, 1984, Ser. No. 594,005

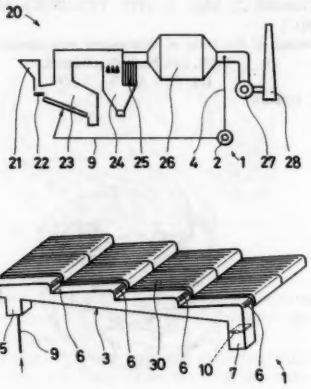
Claims priority, application Japan, Mar. 30, 1983, 58-56270

Int. Cl.³ F23B *5/02;* **F23K** *7/04*

U.S. Cl. 110—204 **1 Claim**

1. A city refuse incinerator for the prevention of clinker formation comprising a furnace body having a sidewall, said refuse incinerator being provided with stoker type firing equipment for moving refuse through said furnace body, and an inert gas circuit comprising: gas injection positioned in said furnace body and directed to inject gas into said furnace body adjacent said sidewall, a dust collector means coupled to said furnace to receive and purify a combustion gas led from the furnace body, a temperature reducing means for lowering the temperature of the combustion gas passing through the dust-collector means and a circulation fan for supplying this purified low temperature inert combustion gas from the dust-collector means to the gas injectors, said gas injectors injecting said inert gas to form a gas curtain concentrated at the inside of said sidewall of the furnace body to thereby inhibit the formation of clinkers on said sidewall;

said gas injectors being formed by a gas injector apparatus which includes a hollow pipe member installed between said stoker type firing equipment inside the furnace body and the sidewall of the furnace body, the upper side of said hollow pipe member having steps shaped thereon with injection openings in the front faces of said steps, said



hollow pipe member further having a gas inlet opening for receiving said purified low temperature inert combustion gas from said dust collector, a selectively operated valved foreign matter discharge opening downstream of said injection openings and a selectively operated valved pressurized air source upstream of said injection openings, whereby said valved foreign matter discharge opening and said selectively operated valved pressurized air source are normally closed to allow said purified low temperature inert combustion gas entering from said gas inlet opening to be passed through said injection openings but being selectively opened for sending compressed air through the hollow pipe member so as to drive foreign matter from the hollow pipe through the foreign matter discharge opening.

4,512,267

METHODS AND APPARATUS FOR COMBUSTING ASH PRODUCING SOLIDS

John M. Cegielski, Jr., Claremore; Gerald D. Campbell, Jenks, and Clyde D. Schaub, Tulsa, all of Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 24, 1984, Ser. No. 573,470

Int. Cl.³ F23D *1/00*

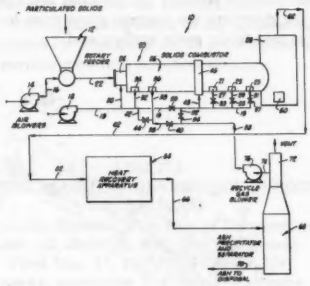
U.S. Cl. 110—347 **26 Claims**

1. A method of combusting particulated ash producing solids comprising:

conveying said particulated solids to an elongated cylindrical combustion chamber;

combining air with said solids and injecting the resulting air-solids mixture longitudinally into said combustion chamber wherein the solids are ignited and combusted;

tangentially injecting a stream of relatively cool gas into the interior of said combustion chamber in a direction transverse to the longitudinal axis thereof so that a helical vortex is created within and along the length of said combustion chamber and the flame, ash and hot gaseous products of combustion produced therein are caused to flow through the central portion of the combustion chamber



surrounded by a sleeve of a cooler gas whereby tacky or molten ash is substantially prevented from adhering to the interior surfaces of said combustion chamber;

cooling said ash and hot gaseous products of combustion in said combustion chamber whereby tacky or molten ash is solidified therein; and

withdrawing the resultant cooled stream of solidified ash and gases from said combustion chamber.

4,512,268

METHOD AND APPARATUS FOR TENSIONING AND SEWING A TUBULAR WORKPIECE

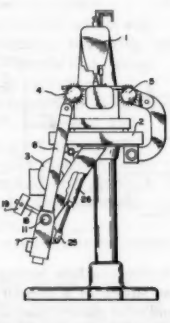
Gunter H. Rohr, Hemmingen, Fed. Rep. of Germany, assignor to Union Special GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1982, Ser. No. 436,764

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142836

Int. Cl.³ D05B *35/00*

U.S. Cl. 112—63 **18 Claims**



1. A tensioning device arranged in combination with an automatic sewing machine capable of sewing along an advancing edge of a tubular workpiece article and having a work supporting surface, said tensioning device comprising:

at least two rotatable tensioning parts for supportably receiving a tubular workpiece edge portion of the article to be sewn; and

means for mounting said tensioning parts on opposite sides of said sewing machine in the direction of the article's advancement, said mounting means including means for holding one of said tensioning parts in a fixed relationship relative to said sewing machine and means responsive to machine actuation for automatically moving the other tensioning part away from the first tensioning part to a free floating position determined by the size of the tubular workpiece edge portion arranged thereabout and along a path extending substantially parallel to said work supporting surface whereby applying a constant predetermined tension to the workpiece edge regardless of the article's size.

4,512,269

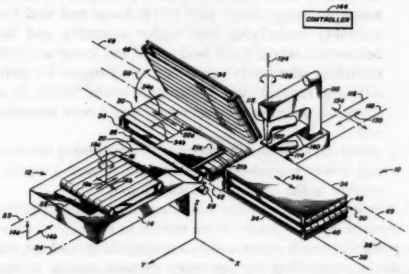
AUTOMATED ASSEMBLY SYSTEM FOR SEAMED ARTICLES

Philip N. Bowditch, Cohasset, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jul. 19, 1983, Ser. No. 515,126

Int. Cl.³ D05B *3/00, 27/00*

U.S. Cl. 112—121.12 **21 Claims**



1. System for joining portions of an elongated strip of limp fabric, said strip being characterized by an associated fabric axis extending along its elongated dimension, comprising:

A. feeder means for selectively feeding a strip of limp fabric with its fabric axis parallel to a first (Y) reference axis, said Y axis being perpendicular to a second (X) reference axis and intersecting therewith,

B. means for folding a portion of said strip of limp fabric onto itself along a fold axis offset from said fabric axis, said folded portion having an upper layer overlying a lower layer,

C. means for supporting said upper and lower layers of said folded portion in a substantially planar fabric locus substantially parallel to said X and Y axes, wherein said supporting means includes:

i. a frame member, a support assembly coupled to said feeder means, and an associated frame X-drive means for selectively positioning said frame member with respect to said support assembly in the direction of said X axis,

ii. a pair of lower belt assemblies coupled to said frame member and including a plurality of continuous loop lower belts having a planar uppermost portion underlying said fabric locus and being adapted on their outer surface for frictional coupling with said lower layer of said folded portion, each of said lower belt assemblies being adjacently positioned along said X axis, each of said lower belt assemblies including an associated lower belt drive means for selectively driving said lower belts whereby said lower layer coupled thereto is positionable in the direction of said X axis,

iii. a pair of upper belt assemblies coupled to said frame member and including a plurality of continuous loop upper belts having a planar lowermost portion opposite and spaced apart from said planar uppermost portion of said lower belts, said upper belts overlying said fabric

locus and being adapted on their outer surface for frictional coupling with said upper layer of said folded portion, each of said upper belt assemblies including an associated upper belt drive means for selectively driving said upper belts whereby said lower layer coupled thereto is positionable in the direction of said X axis, wherein the region between said lowermost portion of said upper belts and said upper portion of said lower belts defines said fabric locus,

D. folded fabric controller including means for selectively controlling said lower belt drive means, said upper belt drive means and said frame X-drive means, whereby said upper and lower layers may be substantially independently positioned in said fabric locus in the direction of said X axis,

E. fabric joiner including:

i. an upper assembly selectively positionable between said upper belt assemblies along said Y axis and, a lower assembly selectively positionable and between said lower belt assemblies along said Y axis, and said upper assembly being above said fabric locus and said lower assembly underlying said upper assembly and being below said fabric locus, said upper and lower assemblies including selectively operable joining means for joining adjacent regions said upper and lower layers in said fabric locus between said upper and lower assemblies, and

ii. joiner drive means for selectively positioning said upper and lower assemblies with respect to said support assembly in the direction of said Y axis,

F. fabric joiner controller including means for selectively controlling said joiner drive means to establish a current position of said upper and lower assemblies and for selectively controlling the operation of said joining means at said current position of said fabric joiner.

18. System for joining portions of a multilayer limp fabric workpiece, comprising:

A. feeder means for selectively feeding said multilayer limp fabric workpiece in the direction of an X reference axis, said X axis being perpendicular to a Y reference axis and intersecting therewith, said fabric workpiece having an upper layer overlying a lower layer,

B. means for supporting said upper and lower layers of said workpiece in a plane fabric locus substantially parallel to said X and Y axes,

C. means for independently, selectively positioning said upper and lower layers in the direction of said X axis,

D. fabric joiner including a joining means adjacent to said fabric locus and associated means for selectively positioning said joining means with respect to said fabric locus along said Y axis, said joining means including selectively operable means for joining said upper and lower layers in said fabric locus at a current position of said joining means,

E. fabric joiner controller including means for establishing a current position of said joining means and for selectively controlling the operation of said joining means.

4,512,270
HEMMING GUIDE CONTROL FOR AN OVERLOCK SEWING MACHINE

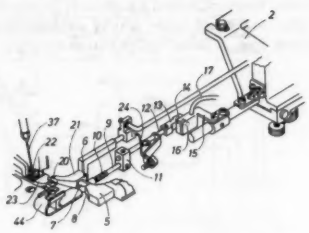
Keizo Nozaki, Kawanishi, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 11, 1983, Ser. No. 457,208
Claims priority, application Japan, Sep. 27, 1982, 57-169318
Int. Cl.³ D05B *1/24*
U.S. Cl. 112—140 **17 Claims**

1. An apparatus for assuring stitching of portions of a fabric just forward of and behind a stepped cross seam in a sewing path, which cross seam extends in a lateral direction out of the plane of the fabric, for use in a sewing machine which includes a sewing needle and means for moving the portion of the fabric to be sewn in a longitudinal direction beneath the sewing needle, said apparatus comprising:

a hemming guide unit having a fabric guide surface for being positioned adjacent the needle such that said fabric guide surface guides the portion of the fabric to be sewn in contact therewith beneath the needle, said hemming guide unit being movable between a first normal position, in which said fabric guide surface guides the fabric, and a second position laterally spaced from said first position;

means for detecting the stepped cross seam longitudinally behind said fabric guide surface; and

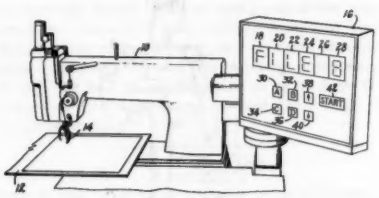


means, responsive to the detection of the stepped cross seam, for moving said hemming guide unit from said first normal position in a first direction so as to move said fabric guide surface away from the fabric to be sewn just before the stepped cross seam crosses beneath the sewing needle, and returning the hemming guide unit to said first normal position just after the stepped cross seam passes under the sewing needle, so as to eliminate excessive pressure on the stepped cross seam by the fabric guide surface along a segment of the sewing path from just forward to just rearward of the stepped cross seam.

4,512,271
PATTERN SELECTION SYSTEM

Donald F. Herdeg, South Hamilton, and William G. Matseas, Rowley, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Oct. 20, 1982, Ser. No. 434,037
Int. Cl.³ D05B *3/02, 21/00*
U.S. Cl. 112—158 E **14 Claims**



1. An automatic sewing machine having a number of predefined stitch patterns stored in a memory, and furthermore having a smaller number of pattern selection switches wherein each of said smaller number of pattern selection switches may be assigned one of said predefined stitch patterns stored in the memory, a system for assigning the predefined stitch patterns in a manner which allows any assigned, predefined stitch pattern to be recalled from memory by activating the pattern selection switch to which the stitch pattern has been assigned, said system comprising:

means for monitoring the status of each pattern selection switch;

means for displaying a message in response to a change in

status of any of the pattern selection switches, the message providing a designation of one of the predefined stitch patterns stored in the memory in the event that a prior assignment of a predefined stitch pattern stored in the memory has been made to the particular pattern selection switch in which a change in status has occurred;

means for altering the displayed message so as to display the designation of a different one of said number of predefined stitch patterns stored in the memory; and

means for storing the designation of the different predefined stitch pattern for subsequent recall upon further activation of the particular pattern selection switch.

4,512,272
SEWING MACHINE REVERSIBLE FEEDING MECHANISM

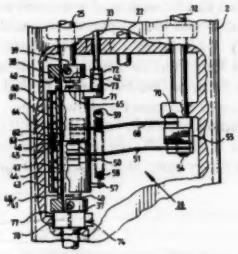
Günter Landwehr, Bielefeld, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,219

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210997

Int. Cl.³ D05B *27/06*

U.S. Cl. 112—311 **13 Claims**



1. A sewing machine comprising:

a housing including a base plate supporting a workpiece;

a rotating shaft pivotally received in said housing;

stitch forming means including:

a reciprocatingly driven needle and

a feed gear reversibly advancing said workpiece with respect to said needle and having:

a first gear part including

eccentric means driven by said shaft for generating an oscillatory movement, and

a second gear part comprising:

a first one-way coupling means connected by drive means to said first gear part for converting said oscillatory movement into a stepwise movement of a direction,

an endless workpiece feed member with a drive connection,

reversing gear means, and

clutch means including shifting means for alternatively connecting said one-way coupling means or said reversing gear means to said feed member,

said reversing gear means comprising a further one-way coupling means similarly structured to said first one way coupling means oppositely-arranged with respect to said one-way coupling means and drivingly connected to said first gear part for converting said oscillatory movement into a stepwise oppositely-directed movement of an opposite direction with respect to said direction.

4,512,273
FEEDING MECHANISM IN A SEWING MACHINE

Kenneth O. E. Skogward, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

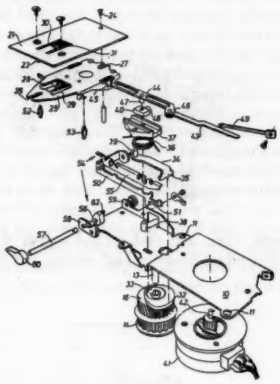
PCT No. PCT/SE82/00374, § 371 Date Jun. 24, 1983, § 102(e) Date Jun. 24, 1983, PCT Pub. No. WO83/01795, PCT Pub. Date May 26, 1983

PCT Filed Nov. 8, 1982, Ser. No. 514,819

Claims priority, application Sweden, Nov. 11, 1981, 8106701

Int. Cl.³ D05B *27/22, 27/24*

U.S. Cl. 112—315 **10 Claims**



1. In a feeding mechanism for a sewing machine, the sewing machine having a stitch plate and drive means, said feeding mechanism having a cloth feeder arranged below the stitch plate, first cam means moving the cloth feeder in a cloth feed direction and second cam means for moving the cloth feeder toward and away from said stitch plate, said first and second cam means being driven by said drive means; the improvement wherein said feeding mechanism further comprises a frame, a guide journalled on said frame about an axis substantially normal to said stitch plate, means coupled to said first cam means for reciprocably moving said guide, said first and second cam means being journalled to said frame, block means slidably mounted on said guide, slide means coupled to said block for moving said cloth feeder in said feed direction upon reciprocation of said guide, and adjustment means for moving said block means in a direction substantially perpendicular to said feed direction for adjusting the movement of said cloth feeder in said feed direction.

4,512,274
SEAM FOR TUBE OF CLOTH, FABRIC OR FLEXIBLE MATERIAL

Richard J. Campbell, Jr., 1006 Orange Grove Ave., Glendale, Calif. 91205, and Kirk B. Campbell, 1531 Broadview, Glendale, Calif. 91208

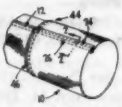
Filed Sep. 1, 1982, Ser. No. 413,794

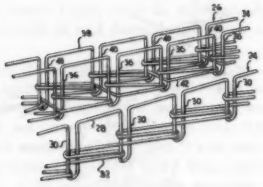
Int. Cl.³ D05B *1/10, 1/18*

U.S. Cl. 112—423 **8 Claims**

1. A longitudinal seam for a fabric and like tube, an outer edge of said tube being radially inwardly reversely folded to define a folded edge portion including a folded edge and a free edge, and an inner edge of said tube underlying said folded edge portion and having a free edge generally aligned with said fold edge portion free edge, a first needle thread disposed adjacent to and parallel to said folded edge and having loops extending through all three of the lapped layers, said first needle thread loops being joined together within said tube by a first looper thread, and second and third needle threads adjacent and on opposite sides of said free edges and parallel to said first needle thread and having loops joined by a second

looper thread, said second needle thread loops extending through all three layers, said third needle thread extending





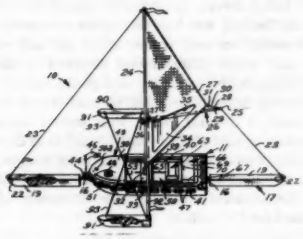
through a single layer, and said second looper thread criss-crossing said free edges between said second and third needle thread loops.

4,512,275

UNSINKABLE ALL-PURPOSE BOAT

Philip R. Drumm, P.O. Box 608, Midtown, New York, N.Y. 10018

Filed Apr. 27, 1983, Ser. No. 489,102
Int. Cl.³ B63B *5/24, 35/72*
U.S. Cl. 114—39 **1 Claim**



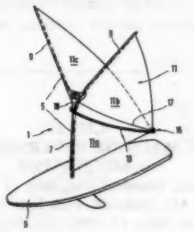
1. An unsinkable all-purpose boat, comprises, in combination, a resilient foam plastic hull, a resilient foam plastic cowl and storage unit frictionally received in said resilient foam plastic hull, a resilient foam plastic seat frictionally received in said resilient foam plastic hull, and a resilient foam plastic storage chest frictionally received in said resilient foam plastic hull, and a plate is removably received in said resilient foam plastic hull and provides support means for a mast and is rectangular in configuration, and one end of a hollow cylindrical sleeve is fixedly secured to one side of said plate in a suitable manner, and said hollow cylindrical sleeve removably receives the bottom end of said mast, and the ends of said plate are frictionally received in a pair of elongated cut-out grooves in the inside surfaces of the side walls of said resilient foam plastic hull, and a fore and aft stabilizer is provided and includes a tube which extends from the bow portion and the transom, and is removably secured in a longitudinal groove provided in the bottom surface of said resilient foam plastic hull, by suitable means, and the ends of said tube are fixedly secured in a resilient foam plastic float in a suitable manner.

4,512,276

SAILBOARD RIG

Georg Hamann, Loherfeldweg 8, 8211 Schleching, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,677
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234582
Int. Cl.³ B63B *35/72*
U.S. Cl. 114—39 **8 Claims**



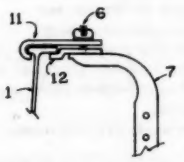
1. A sailboard rig comprising a mast, a sail, a boom for holding and moving the sail, a mast foot joint for connection of said mast to a sailboard so that said mast may be turned and heeled over, said sail being joined with said mast at a sail luff and with an end of said boom spaced from said mast, said mast being generally Y-like with a lower mast section running up from said mast foot joint to a branch point and then further upwards in the form of two outwardly forked mast arms, said sail having a lower sail panel and two upper, outwardly and upwardly spreading panels in keeping with the Y-like form of the mast and a Y-like luff, the two upper sail panels being joined with the lower panel along a seam running to an aft limit of said sail.

4,512,277

ADJUSTABLE CANOE PONTOONS

Donald F. Williams, 53 E. Lakewood Dr., Fenton, Mo. 63026

Continuation of Ser. No. 369,513, Apr. 19, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 571,340
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—364 **3 Claims**



1. An adjustable two-piece clamping device for mounting a pontoon to the top flat surface of a "T"-shaped gunwale of a canoe comprising a first clamp adapted to engage the top and inboard bottom surface of said "T"-shaped gunwale lying flat across the top thereof and a second clamp adapted to engage the outboard bottom surface of said "T"-shaped gunwale and having a bolt and nut connecting said first and second clamp to the upper end of an outrigger arm for attachment to a pontoon, said nut and bolt providing an upper pivot point to allow said clamp to conform to the different shapes of various length canoes.

4,512,278

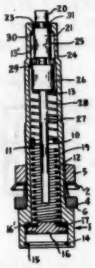
VEHICLE TIRE DEFLATION SIGNALLING SYSTEM

Harry C. Winther, Chestertown, Md., assignor to Winther Family Members, Pa.

Continuation of Ser. No. 182,606, Aug. 29, 1980, abandoned. This application Aug. 12, 1983, Ser. No. 522,741

Int. Cl.[3] B60C *23/04*

U.S. Cl. 116—34 R 9 Claims



1. A valve and low-pressure indicator assembly for a pressurized container comprising:

(a) a tubular housing having a downwardly-facing seat;

(b) a valve poppet cooperating with the seat;

(c) spring means biasing the valve poppet away from the seat, the spring means being overcomeable by air pressure within the pressurized container above a preestablished pressure;

(d) mounting means intermediate the level of the seat and the upper end of the housing for mounting the valve assembly to the pressurized container;

(e) said poppet and seat being located and protected inside the pressurized container;

(f) an indicator piston reciprocable in the housing and having an upper portion adapted to be seen and indicate low pressure, the piston having an upper position for indicating, a lower position for venting, and a normal position intermediate the two, the piston having a downward extension adapted to engage the poppet and forcibly open it when the piston is moved manually down to the lower position, the piston sealingly engaging the wall of the housing except in the venting position;

whereby when the pressure in the container drops, the poppet opens and the piston is driven to indicating position and whereby from the upper end of the housing the container may be vented by pressing down the piston to open the poppet, and gauged or filled by placing a gauge or filling chuck over the top of the housing and pressing the piston down to open the poppet.

4,512,279

PAPER COATING APPARATUS

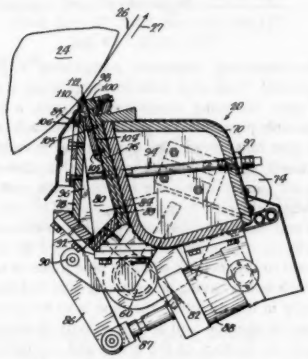
Wayne A. Damrau, and James C. Gauss, both of Wisconsin Rapids, Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Continuation of Ser. No. 863,464, Dec. 22, 1977, , which is a continuation-in-part of Ser. No. 683,669, May 6, 1976, abandoned. This application Jun. 10, 1983, Ser. No. 501,969

Int. Cl.[3] B05C *5/02*

U.S. Cl. 118—411 2 Claims

1. A coating applicator for applying coating liquid to one side of a moving web of paper, comprising means for supporting the moving web in position located on the other side of the web, a beam carrying a front wall and a rear wall forming a chamber extending substantially across and parallel to the web, said chamber having a header with at least one coating liquid inlet and discharging between said front and rear walls, said chamber receiving the coating liquid from said header, said chamber defining a narrow outlet slot extending across the web and adjacent thereto, means for delivering coating liquid through said header, said chamber and said outlet slot and onto said web at a pressure of between 150 and 7 inches of water, a single doctor blade located at a rear edge of said outlet slot on the rear wall of said chamber for doctoring the coating liquid on the web, said doctor blade being spaced from a front edge of said front wall by a small dimension such that the blade doctors the coating liquid on the web within about 0.0004 to about 0.0100 second of the pressure application of the coating to the web, and end dam means for sealing the end spaces between said front and rear walls and said doctor blade with the web, the front edge of said front wall of said chamber being spaced less than one inch from the web, a liquid seal established between said front edge of said front wall and the web continuously across the web at the front edge of said outlet slot by flow of coating liquid under said pressure reversely of the direction of web travel through the space between said front edge of said front wall and the web, said liquid seal causing the coating liquid in said chamber and between said doctor blade and said seal to be held under said pressure while permitting reverse flow of coating liquid between said front edge and the moving web for establishing said liquid seal, for sealing off the forward edge of said chamber against entry of air and foreign matter, for continuously purging said chamber, and for causing said blade to doctor the coating liquid on the web while said



coating liquid is held under said pressure, whereby said moving web may be coated with coating applied primarily to the surface of the web and doctored almost immediately so that there is a minimum penetration of coating liquid beyond the surface of the web into the paper; an orifice plate comprising said front edge of said front wall and adjustably mounted on said front wall for movement toward and away from the web for establishing a desired clearance between the front edge of said orifice plate and the web, and means for adjusting said orifice plate to establish a clearance of less than one inch which, in relation to the delivery of coating liquid, is such as to cause a reverse flow of coating liquid under said pressure between said front edge of said orifice plate and the moving web sufficient to maintain said liquid seal and said coating liquid pressure in said chamber; said adjusting means comprising an adjustable member slidable on said front wall in a direction transverse to the movement of said orifice plate and having inclined slots therein, said front wall having vertical slots therein intersecting said inclined slots, said orifice plate carrying first and second cam means engaged respectively in said inclined and vertical slots, the cam means engaging in said inclined slots comprising rotatable rollers eccentrically and adjustably mounted on said orifice plate to provide for uniform engagement thereof within said inclined slots, whereby movement of said adjustable member in a direction transverse to the movement of said orifice plate causes said orifice plate to move

linearly toward or away from said web uniformly over its length.

4,512,280

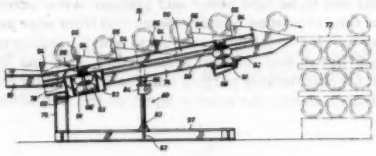
PIPE CONVEYING APPARATUS

Roy Lee, Jr., 10134 Briar Dr., Houston, Tex. 77042

Continuation-in-part of Ser. No. 267,994, May 28, 1981, abandoned. This application Oct. 21, 1982, Ser. No. 435,726

Int. Cl.³ B05C *3/09*

U.S. Cl. 118—426 **4 Claims**



1. Pipe conveying apparatus comprising a plurality of spaced, parallel, fixed pipe rails for supporting a plurality of joints of pipe extending transverse the rails, a plurality of spaced movable pipe rails that are parallel to each other and to the fixed pipe rails, means for moving the movable rails between a raised position where the pipe joints above the movable rails are supported by the movable rails and a lowered position where the pipe joints are supported by the fixed rails, said fixed and movable rails having adjacent notches on their upper surfaces, said notches being arranged in transversely aligned rows to support one or more pipe joints in each row of notches, each notch having an upstream side that slopes gently downwardly in the direction the pipe is to be moved so that pipe supported thereon will roll by gravity down the sloping side toward the bottom of the notch and a downstream side extending upwardly to stop the movement of the pipe when it reaches the bottom of the notch, said notches on the movable rail being positioned so that when the movable rails are moved to their raised position the gently sloping upstream sides of the notches on the movable rails will lift the pipe resting in the bottom of the notches on the fixed rails above the downstream sides of the notches on the fixed rails where the pipe will roll down the gently sloping upstream sides of the notches on the movable rails until stopped by the downstream sides of the notches so that when the movable rails are moved to their lowered positions, the pipe will be deposited on the gently sloping upstream sides of the next row of notches on the fixed rails from where the pipe will roll downwardly to the bottom of the next row of notches on the fixed rails so that each pipe joint resting at the bottom of a row of notches on the fixed rails will be moved one row of notches each time the movable rails are moved from their lowered position to their raised position and returned to their lowered position, means mounting a section of the fixed and movable pipe supporting rails for pivotal movement as a unit around an axis parallel to the rails and means for moving the section around its pivotal axis between a first position in which the pipe is substantially horizontal and a second position where one end of each pipe joint supported by the section is lowered into a tank containing a liquid, such as an acid phosphate solution used to inhibit the formation of rust.

4,512,281

METHOD FOR COATING OPTICAL TRANSMISSION GLASS FIBERS

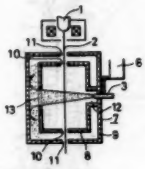
Toru Yamanishi; Katsuyuki Tsuneishi, and Masaaki Yoshida, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Sep. 6, 1983, Ser. No. 529,779

Claims priority, application Japan, Sep. 3, 1982, 57-154335; Dec. 22, 1982, 57-223896

Int. Cl.³ B05B *5/02;* **B05C** *5/02;* **B05D** *5/06*

U.S. Cl. 118—627 **7 Claims**



1. An apparatus for resin-coating an optical transmission glass fiber comprising:

a vessel comprising an outer casing and an inner casing positioned within said outer casing, said inner and outer casings having apertures in top and bottom portions thereof for passing an optical fiber to be coated;

means for spraying a resinous composition against said fiber to be coated, said spraying means being disposed at one side of said inner and outer casings, and said inner casing having an exhaust vent provided therein on a side thereof opposite said spraying means for passing surplus particles of said resinous composition.

4,512,282

APPARATUS FOR COATING PLATE-SHAPED BODIES OF GLAZED CERAMIC (TILES), GLASS OR ENAMEL

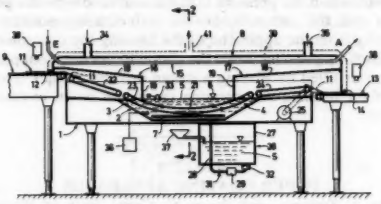
Erwin W. Wartenberg, Brunnenwiesen 6, 7000 Stuttgart 71, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,759

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242166

Int. Cl.³ B05C *3/10*

U.S. Cl. 118—666 **9 Claims**



1. Apparatus for applying a thin, adhesive coating to plate-shaped bodies of glazed ceramic (tiles), glass or enamel by dipping the bodies into a liquid bath in which a substance constituting the coating is dissolved, comprising the following features:

(a) a heated tank for receiving the dipping substance;

(b) a cover hood shielding the tank and the liquid bath from the environment and comprising inlet and outlet slits for the plate-shaped bodies;

(c) a cooling device arranged in the cover hood;

(d) a conveyor mechanism extending from the inlet to the outlet slit through the tank and running at a constant transportation speed, said conveyor mechanism comprising three successively arranged conveyor sections, with

the first covering substantially the area between the inlet slit and the liquid surface, the second extending substantially exclusively in the tank on a downwardly curved path, and the third covering substantially the area between the liquid surface and the outlet slit;

(e) a pumping mechanism for adjustment of the dipping time by lowering and raising the liquid level in the tank.

4,512,283

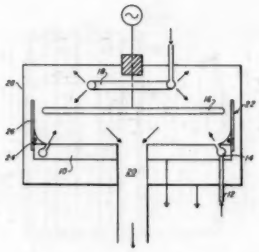
PLASMA REACTOR SIDEWALL SHIELD

Thomas D. Bonifield, and Andrew J. Purdes, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 344,586, Feb. 1, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 549,341

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—723 **24 Claims**



1. A plasma reactor comprising:

a substrate holder;

an electrode opposed to said substrate holder;

a reactor chamber comprising a plurality of walls enclosing said substrate holder and said electrode;

means for introducing reagent gases at the periphery of said substrate holder; and

a sidewall shield, said sidewall shield surrounding, touching and in thermal contact with the periphery of said substrate holder and being spaced apart from said walls of said chamber.

4,512,284

GLOW DISCHARGE APPARATUS FOR USE IN COATING A DISC-SHAPED SUBSTRATE

John W. Robinson, Levittown, Pa., and Grzegorz Kaganowicz, Belle Meade, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1983, Ser. No. 563,230

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—723 **10 Claims**

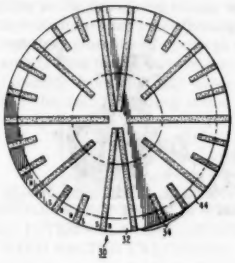
1. In a magnetically enhanced glow discharge apparatus for use in coating a substrate, which apparatus comprises

a vacuum chamber including an outlet means for evacuating said chamber and an inlet means for introducing appropriate reactant precursors into said chamber;

at least one electrode assembly within said chamber connected to a power source, which assembly comprises an electrode which has a diameter greater than that of the substrate and magnets, electrically insulated from said electrode but arranged in such proximity to said electrode that a magnetic field created by said arrangement holds the glow between the electrode and the substrate without interfering with deposition onto the substrate; and

means for holding the substrate parallel to, but apart from, said electrode;

the improvement comprising that the magnets are arranged in a quasi-radial fashion provided by disposing magnets of varying length within the perimeter of the electrode assembly extending toward the center of said assembly, and so that the area of the magnets is distributed in a substantially proportional manner with respect to the area of the



substrate to be coated, whereby a more uniform coating at a lower temperature and higher description rate is deposited.

4,512,285

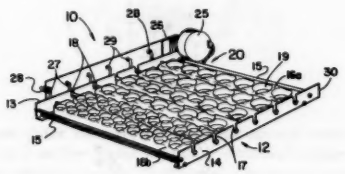
APPARATUS AND METHOD FOR EGG TURNING DURING INCUBATION

R. Stephen McGehee, Savannah, Ga., assignor to Gof Manufacturing Company, Inc., Savannah, Ga.

Filed Dec. 27, 1983, Ser. No. 566,117

Int. Cl.³ A01K *41/06*

U.S. Cl. 119—44 **4 Claims**



1. A method for egg turning during incubation, comprising:

rotatively supporting along a selected axis of rotation each of a plurality of egg trays; and

continuously and smoothly oscillating said trays unitarily at a selected frequency through a selected angle about their respective axes of rotation, such that there is no substantial period of nonmovement of said trays during operation; and

wherein said frequency is selected in the range of about one cycle per two days to two cycles per hour and said angle is selected in the range of about plus and minus 25 to 60 degrees, further provided that said frequency and said angle are relatedly selected to substantially optimize incubation hatch rate.

4,512,286

PET SEAT FOR AUTOMOBILES

Paul R. Rux, 5125 Mountain View Dr., Las Vegas, Nev. 89102

Filed Jun. 20, 1983, Ser. No. 505,768

Int. Cl.³ A01K *3/00; 27/00*

U.S. Cl. 119—96 **12 Claims**

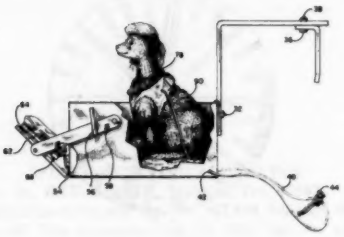
1. A container for supporting a pet in a vehicle comprises a bottom wall, side walls, and a normally open top,

a front wall hingedly attached at a lower portion thereof to the container and movable between a first substantially horizontal position and a second position,

stop means for selectively retaining said wall in any of said

first position, said second position, and at least one position therebetween,

mounting means for fastening the container to a seat of a vehicle, and



restraining means for securing an animal to prevent the animal from leaving the container.

4,512,287

DEVICE FOR TYING-UP AN ANIMAL

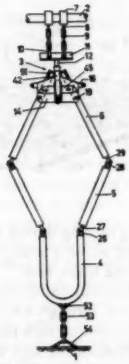
Christiaan A. C. Vandekeybus, Kloosterstraat 21, B - 2190 Essen, Belgium

Filed Dec. 21, 1982, Ser. No. 451,836

Claims priority, application Belgium, Jan. 4, 1982, 2/59531; Apr. 28, 1982, 2/59682; Jul. 9, 1982, 2/59771

Int. Cl.³ A01K *1/062*

U.S. Cl. 119—147 R **10 Claims**



1. A device for tying-up an animal comprising:

a suspension element,

two parallel and substantially horizontal bolts supported by the suspension element,

a multiple yoke comprising top parts which are pivotally mounted on said bolts, said top parts having top ends which project above the said bolts, said top parts pivoting between a closing position and an open position and having in the closing position the top ends remote from each other and in the open position the top ends close to each other,

means comprising a spring which acts on both top parts and which in the closing position is in a first position and in the open position is in a second position, said means thus retaining the top parts in the closing position when said spring is in its first position and retaining the top parts in the open position when said spring is in its second position,

lever mounted relative to the suspension element, said lever controlling said means to bring said spring from its first position to its second position, thus bringing the top parts from the closed position to the open position, and

a spacer member movable between a first position and a second position and which in its first position is present between and against said top ends of said top parts and which in its second position does not engage said top ends of said top parts, said spacer member being mounted on said lever.

4,512,288

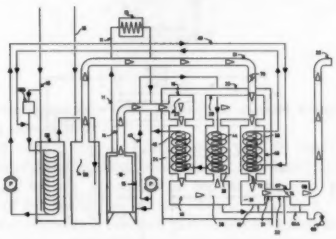
FURNACE HEAT EXCHANGER

Roger Michaud, 530 Patricia Blvd., Timmins, Ontario P4N 6Z2, Canada

Filed Jul. 15, 1983, Ser. No. 514,054

Int. Cl.³ F22B *33/00*

U.S. Cl. 122—20 B **16 Claims**



1. A heat recovery system for recovering heat from the flue gases of a plurality of heating appliances each supplying heat to a respective heat transfer medium, said system comprising first and second interconnected duct means to receive the flue gases of respective ones of said appliances and convey the gases to a common outlet, a first heat recovery circuit operatively connected to said heat transfer medium of said first appliance and including a first heat exchange means located in said first duct and a second heat recovery circuit operatively connected to said heat transfer medium of said second appliance and including a second heat exchange means in said second duct said ducts being arranged such that one of said heat exchange means is supplied with flue gases from only one of said appliances.

4,512,289

WATER HEATER WITH COMBINATION MAGNETIC AND AGITATOR MEANS

Denver G. Collins, Ashland City, Tenn., assignor to State Industries, Inc., Ashland City, Tenn.

Continuation of Ser. No. 561,055, Dec. 13, 1983, abandoned, and a continuation of Ser. No. 380,521, May 12, 1982, abandoned. This application May 29, 1984, Ser. No. 614,978

Int. Cl.³ F22B *37/18*

U.S. Cl. 122—380 **1 Claim**

1. A water heater for heating water containing iron molecules comprising:

a water tight tank means adapted to contain water under pressure;

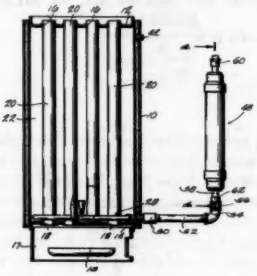
a source of heat for heating water inside said tank means;

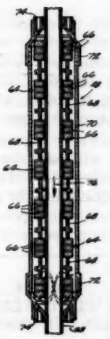
a hot water outlet means located in the top portion of said tank means for periodically withdrawing heated water from the top portion of said tank means;

a cold water inlet means located in the bottom portion of said tank means for admitting cold water into said tank means when hot water is withdrawn from said hot water outlet means;

a magnetic means having an inlet connected to a source of water under pressure and an outlet connected to said cold water inlet means, said magnetic means including a flow passageway means extending between said inlet and said

outlet and a plurality of permanent magnet means mounted on said flow passageway means and spaced along the length thereof, each of said permanent magnet means producing magnetic lines of force which pass through the interior of said flow passageway means so that water flowing thru said flow passageway means will pass thru said magnetic lines of force, said flow passageway means of said magnetic means being in the form of a tubular member made of non-metallic material, said permanent magnet means including spaced sets of doughnut-shaped permanent magnets mounted on said tubular member, each of said spaced sets of permanent magnets having a north pole on one end face thereof and a south pole on the other end face thereof, said permanent magnets producing lines of flux which extend parallel to the direction of flow of water through said tubular member, spacer members of non-magnetic material are positioned between each group of doughnut-shaped permanent magnet members and said magnetic means includes a jacket made of non-magnetic material mounted on said tubular member and enclosing said permanent magnet members and spacer members;





an agitator assembly means mounted in the bottom portion of said tank, said agitator assembly means including a tubular member connected to said cold water inlet means, said tubular member extending into said water tight tank means and having a plurality of small openings therein spaced along the length thereof to direct multiple streams of water under pressure into the tank each time water is drawn out of the top portion of said tank means through said hot water outlet means, said plurality of openings in said tubular member positioned so that said multiple streams of water will be directed to sweep over the bottom of the tank means to create a stirring action in the lower portion of said tank means to thereby cause solid materials which have either settled to the bottom or are in the process of settling to the bottom to be maintained in suspension in the water so that ultimately at least a portion of such materials will be carried upwardly in said tank means and out said hot water outlet means, the relationship of the aggregate size of the small openings in said tubular member to the size of said tubular member itself is such that the velocity of the water flowing into said tank means through said plurality of openings in said tubular member is greater than the velocity of water flowing into said tubular member from said cold water inlet means to thereby create the desired stirring action in the bottom portion of said tank means.

4,512,290

CRANK GUIDE ASSEMBLY FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR TWO-STROKE INTERNAL COMBUSTION ENGINES WITH FACING CYLINDERS

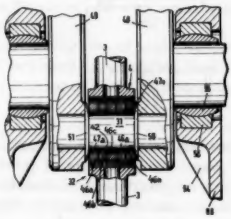
Reinhold Ficht, Kirchseeon, and Manfred Schindler, Markt Schwaben, both of Fed. Rep. of Germany, assignors to Ficht GmbH, Kirchseeon, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,767

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218311

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—56 BC **4 Claims**



1. Crank guide assembly for use with internal combustion engines, such as two-stroke internal combustion engines, with the engine including a pair of oppositely disposed cylinders in coaxial alignment each having a piston rod attached to a piston in the cylinder with the piston rod extending out of the cylinder, a crankcase sealed with respect to the cylinders with the piston rods extending into the crankcase, said crank guide assembly comprises a crankpin rotatably mounted in the crankcase, a crank guide located within the crankcase connected to said piston rod and extending around said crankpin, a sliding piece mounted on said crankpin and sliding in said crank guide, said sliding piece forming the bearing surfaces between said crankpin and said crank guide and said sliding piece comprises ceramic components which slide on one another, said ceramic components comprise a plurality of ceramic rings each closely encircling said crankpin and a corresponding number of ceramic discs encircling said ceramic rings, a pair of ceramic platelets are located between said crank guide and said ceramic components located around said crankpin, said ceramic platelets having a width corresponding to the dimension of said crank guide in the axial direction of said crankpin, and a clamped joint connecting said ceramic platelets to said crank guide.

4,512,291

INTERNAL COMBUSTION ENGINE

J. David Kirk, 2252 Ottawa Rd., Waukegan, Ill. 60087

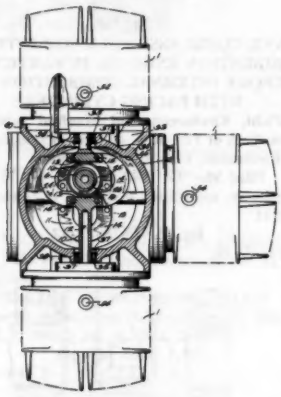
Filed May 26, 1983, Ser. No. 498,398

Int. Cl.³ F02B *75/24*

U.S. Cl. 123—56 BC **7 Claims**

1. A radial two-stroke internal combustion engine having two pairs of opposed cylinders arranged on axes at 90 degrees to one another and having a single throw crankshaft, each pair

of cylinders having opposed pistons, a piston rod rigidly connected to each piston and extending inwardly to a cross piece having a load face transverse the axis of the engine, a pair of rollers mounted on the single throw of said crankshaft each in alignment with and engaged by the load faces of a pair of the piston rods, apertured retention plates with each plate on opposite sides of each roller along the axis of the crankshaft fixed to the cross pieces with the roller in engagement with the load faces and the crankshaft extending through the apertures, the plates being fixed to the inner ends of each of the rods by



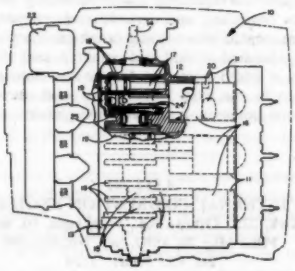
dowel bolts positively locating and spacing the load faces and the retention plates, the two pairs of pistons being axially offset, and counterweights on said crankshaft, wherein each of the rollers includes a bearing assembly having an interior and an exterior with roller elements therebetween, said interior being fixed on the crankpin, a lightweight alloy annulus having an interior and an exterior and said interior of said annulus being press fit on said exterior of the bearing assembly to reduce the mass of the roller assembly, and a wear shell press fit on said exterior of said annulus and engageable with said faces of the heels.

4,512,292

ACCESSORY GEAR DRIVE FOR A TWO-CYCLE ENGINE

James M. Hundertmark, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 19, 1983, Ser. No. 563,326
Int. Cl.³ F16H *55/06*
U.S. Cl. 123—65 B **12 Claims**



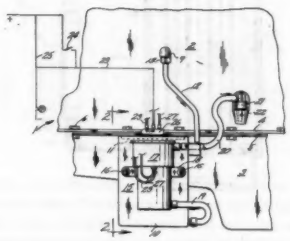
1. A two-cycle crankcase compression engine comprising:
(A) a cylinder block having a cylinder;
(B) a crankcase member defining with said cylinder block a crankcase;
(C) a crankshaft mounted for rotation in said crankcase;
(D) a piston means mounted for reciprocation in said cylinder and coonnected to said crankshaft;
(E) an intake means for admitting lubrication oil and a combustible mixture to said crankcase;
(F) a worm member mounted on said crankshaft inside said crankcase, said worm member formed of a low friction plastic material and having a helical tooth; and
(G) a worm gear mounted on said engine in engagement with said helical tooth.

4,512,293

OIL RECOVERY SYSTEM FOR TWO CYCLE DIESEL ENGINES

Steven C. Mast, 2175 Garfield, Eugene, Oreg. 97405, and Frederick D. Altman, 3120 County Farm Rd., Eugene, Oreg. 97401

Filed Apr. 16, 1984, Ser. No. 601,012
Int. Cl.³ F02B *75/02*
U.S. Cl. 123—65 B **4 Claims**



1. An oil return system for collecting lubricating oil from a Diesel engine air box of a vehicle and returning same to an engine lubricating oil sump, said system comprising,
a reservoir including mounting means,
means communicating the engine air box with said reservoir for delivery of air box oil to the reservoir,
an electric pump in place on said reservoir and a pump inlet in communication with said reservoir, a pump outlet in communication with the interior of the engine for discharging lubricating oil into the engine, and
switch means in circuit with a power source and with said pump to control pump operation.

4,512,294

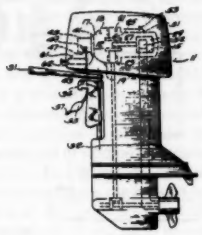
OUTBOARD MOTOR WITH SELECTIVELY OPERABLE DRAINAGE SYSTEM

James W. Mohr, Brookfield, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 408,839, Aug. 17, 1982, Pat. No. 4,461,250, which is a continuation of Ser. No. 119,081, Feb. 6, 1980, abandoned. This application Feb. 2, 1984, Ser. No. 576,277
Int. Cl.³ F02B *33/04*
U.S. Cl. 123—73 R **11 Claims**

1. A valve for an ouboard motor including a cylinder, a crankcase extending from said cylinder and including an upper portion having a bearing and a lower portion having a drains outlet, a transfer passage extending between said cylinder and said crankcase, a drains return inlet in one of said cylinder and said transfer passage, an overboard drain, and a fuel supply system including an inlet manifold communicable with said cylinder and having a drains outlet, and a carburetor communicating with said inlet manifold and having a drainage outlet, said valve comprising a valve housing having therein an elongated valve chamber, first and second drains inlet ports communicating with said chamber in spaced relation to each other and adapted to communicate with said manifold drains outlet

and with said crankcase drains outlet, port means communicating with said chamber and adapted to communicate with said crankcase bearing and said drains return inlet, a drains overboard port communicating with said chamber in spaced relation to said port means and adapted to communicate with said overboard drain, a carburetor drainage inlet port communicating with said chamber and adapted to communicate with said carburetor drainage outlet, a carburetor drainage overboard port communicating with said chamber and adapted to communicate with said overboard drain, and a valve member



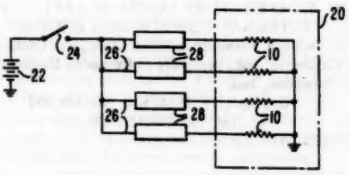
movable in said valve chamber between a run position and a drain position, said valve member including means cooperating with said ports so that, when said valve member is in said run position, said first drains inlet port is in communication with said port means, and said second drains inlet port and said carburetor drainage inlet port are blocked by said valve member and, when said valve member is in said drain position, said second drains inlet port communicates with said drains overboard port, said carburetor drainage inlet port communicates with said carburetor drainage overboard port, and said first drains inlet port is blocked by said valve member.

4,512,295

DIESEL GLOW PLUG TIP ENLARGEMENT PROTECTION

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Dec. 17, 1982, Ser. No. 450,858
Int. Cl.³ F02P *19/02*
U.S. Cl. 123—145 A **6 Claims**



1. For a diesel engine having at least one glow plug means including glow plug tip means adapted to be electrically energized for heating the glow plug tip means, an arrangement for preventing enlargement of the tip means after a short of the tip means, comprising:

a separate series connection for energizing each of one or more of said glow plug means; and

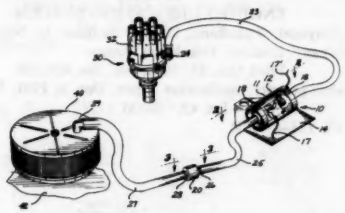
a separate, cyclable circuit interruption means in each said series connection operable to open said connection within a fraction of a second in response to current through said interruption means of a value corresponding to a short of said tip means.

4,512,296

DISTRIBUTOR MOISTURE GUARD

Allen G. Herrington, P.O. Box 93, Lynnwood, Wash. 98036, and Nicholas L. Herrington, 14600 51st Ave. NE. #46, Marysville, Wash. 98270

Filed Jun. 4, 1984, Ser. No. 617,040
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—146.5 R **14 Claims**



1. A system for removing moisture from the distributor of a spark-ignition engine, said distributor including vents and a cap connected to a base, said engine including air intake means for conducting a flow of air therethrough, said system comprising:

a shell having an internal chamber, said shell including an outlet port and an inlet port which communicate with said internal chamber;

means connected to the cap of said distributor and to the inlet port of said shell for providing fluid communication between the interior of said distributor and said internal chamber;

a valve having an inlet and an outlet, said inlet being connected in fluid communication with the outlet port of said shell, said valve being selectively operable to permit a one-way fluid flow from its inlet to its outlet;

conduit means for connecting the outlet of said valve in fluid communication with said intake means; and

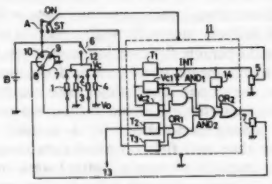
means for sealing the vents of said distributor.

4,512,297

APPARATUS FOR CONTROLLING ENERGIZATION OF GLOW PLUGS

Sadao Ichikawa, and Tuyoshi Kamiya, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd. and Nissan Motor Company, Limited, both of, Japan

Filed Sep. 9, 1983, Ser. No. 530,917
Int. Cl.³ F02P *19/02*
U.S. Cl. 123—179 H **4 Claims**



1. An apparatus for controlling energization of quick-heating glow plugs in a diesel engine, comprising:

(a) a power supply;

(b) a main relay having a normally open contact;

(c) a transfer-type changeover relay having a neutral terminal, a normally closed terminal connected to ground, and a normally open contact connected to said power supply;

(d) a plurality of pairs of glow plugs, said glow plugs each having one terminal connected through the normally open contact of said main relay to said power supply, said glow plugs in each pair having one of other terminals grounded

and the other terminal in each pair connected to said neutral terminal of said transfer-changeover relay; and

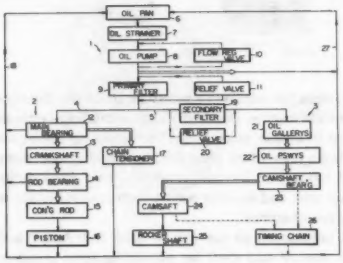
(e) a control circuit for controlling said main and changeover relays to connect said glow plugs in each pair selectively in series or parallel to each other with respect to said power supply.

4,512,298

ENGINE LUBRICATING SYSTEM

Isao Hayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 21, 1982, Ser. No. 438,358
Claims priority, application Japan, Dec. 9, 1981, 56-198165
Int. Cl.³ F01M *11/10*
U.S. Cl. 123—196 R **6 Claims**



1. An engine lubricating system of an internal combustion engine including a power producing mechanism including a crankshaft and a valve drive mechanism including a cylinder head, a camshaft, a camshaft timing mechanism to transmit driving power from the crankshaft to the camshaft, and members which are associated with the camshaft and which are to be subjected to sliding motion during operation of the engine, comprising, in combination,

lubricating oil delivery means for delivering lubricating oil under controlled pressure when the engine is in operation, the lubricating oil delivery means comprising a primary filter unit having included therein a porous filter medium having perforations measuring about 15 to 20 microns in width, length and/or diameter;

first lubricating means communicating with the lubricating oil delivery means through a first oil feed passageway and operable for circulating oil from the lubricating oil delivery means to said power producing mechanism of the engine; and

second lubricating means communicating with said lubricating oil delivery means through a second oil feed passageway and operable for circulating oil from the lubricating oil delivery means to said valve drive mechanism of the engine, the second lubricating means comprising a secondary filter unit having included therein a porous filter medium having perforations [of a second range of sizes smaller than said first range of sizes]measuring about 5 angstroms to 10 microns in width, length and/or diameter;

said second lubricating means further comprising:

oil galleries formed in the cylinder head of the engine and upstream communicating with said secondary filter unit;

oil passageway means including oil passageways formed in the brackets supporting the camshaft and upstream communicating with the oil galleries;

camshaft-bearing lubricating means upstream communicating with the oil passageway means and adapted to lubricate the bearings receiving the journal portions of the camshaft; and

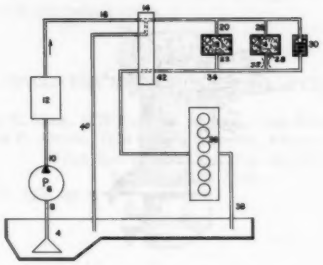
camshaft lubricating means upstream communicating with the camshaft-bearing lubricating means and adapted to feed oil into the oil passageways in the camshaft.

4,512,299

AUTOMOTIVE ENGINE WITH IMPROVED MULTIFILTER LUBRICATION SYSTEM

John J. Egan, Wheaton, and Andrew B. Witkowski, Oakbrook Terrace, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 12, 1983, Ser. No. 560,762
Int. Cl.³ F01M *1/00*
U.S. Cl. 123—196 A **19 Claims**



1. An automotive internal combustion engine with an oil lubrication system comprising:

an oil pump for delivering a pressurized oil flow through said oil lubrication system;

at least one primary oil filter having an inlet port which fluidly communicates with a first part of the pressurized oil flow, said primary oil filter having a first micron rating, and said primary oil filter having an outlet port;

at least one secondary oil filter having an inlet port which fluidly communicates with said second part of the pressurized oil flow, said second part of the pressurized oil flow being less than said first part of the pressurized oil flow, said secondary oil filter having a second micron rating, said second micron rating being lower than said first micron rating, and said secondary oil filter having an outlet port;

means for restricting the second part of the pressurized oil flow through said secondary filter;

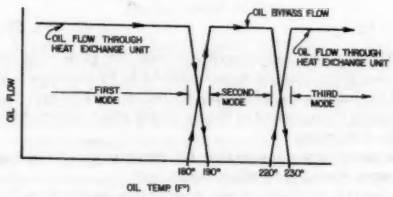
an engine block which fluidly communicates with said outlet ports of said primary and secondary oil filters.

4,512,300

OIL TEMPERATURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

James R. DeVore, Farmington Hills, Mich., and Leslie A. Roettgen, Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 17, 1984, Ser. No. 601,307
Int. Cl.³ F01M *1/00*
U.S. Cl. 123—196 AB **5 Claims**



1. In a diesel engine, a system for regulating the oil temperature during predetermined engine operating modes, said system comprising a single heat exchange unit through which all

of the oil is adapted to flow when the engine is operating in certain modes; a single passage through which all of said oil is adapted to flow and bypass said unit when the engine is operating in another mode; a single valve having a housing provided with an oil inlet port, longitudinally spaced first oil outlet ports communicating with said unit, a second oil outlet port disposed intermediate said first outlet ports and communicating with said bypass passage, and adjustable means effecting interconnection between said oil inlet port and a selected outlet port; and temperature sensing means operatively connected to said valve means to effect adjustment thereof in accordance with said engine operating modes; when in a first mode wherein the oil temperature is below a predetermined temperature range, said valve means effecting interconnection of said inlet port and one of said first outlet ports whereby all of said oil is heated in said unit to within said predetermined temperature range; when in a second mode wherein the oil temperature is within said predetermined temperature range, said valve means effecting interconnection of said inlet port and said second outlet port causing all of said oil to bypass said unit; and when in a third mode wherein the oil temperature is above said predetermined temperature range, said valve means effecting interconnection of said inlet port and the other of said first outlet ports causing all of said oil to be cooled within said unit.

4,512,301

INTERNAL COMBUSTION ENGINE PROVIDED WITH A PLURALITY OF POWER UNITS

Toru Yamakawa, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

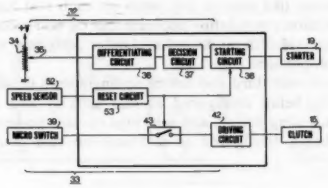
PCT No. PCT/JP81/00360, § 371 Date Jul. 29, 1982, § 102(e) Date Jul. 29, 1982, PCT Pub. No. WO82/02226, PCT Pub. Date Jul. 8, 1982

PCT Filed Nov. 30, 1981, Ser. No. 403,740

Claims priority, application Japan, Dec. 25, 1980, 55-184780

Int. Cl.³ F02D *25/04, 17/02*

U.S. Cl. 123—198 F **15 Claims**



1. In an internal combustion engine for motor vehicles, having a primary engine unit, an auxiliary engine unit selectively operating with the primary engine unit, primary and auxiliary carburetors each having a throttle valve for producing an air-fuel mixture to the primary and auxiliary engine units, respectively, and clutch means for selectively connecting the output of the auxiliary engine unit to the output of the primary engine unit, the improvement comprising

acceleration sensing means for sensing the magnitude of the acceleration of the primary engine unit and for producing a first output signal dependent on a predetermined magnitude of the acceleration,

an auxiliary starter means for starting for said auxiliary engine unit,

a starting circuit means for operating said auxiliary starter means in response to said first output signal at a proper time,

engine speed sensing means for sensing the engine speed of said auxiliary engine unit and for producing a second output signal at a predetermined engine speed such that said second output signal causes said starting circuit means to stop said auxiliary starter means,

throttle position detecting means for producing a third output signal at a predetermined opening degree of the throttle valve of said primary engine unit,

a driving circuit means for engaging said clutch means in dependency on said third output signal.

4,512,302

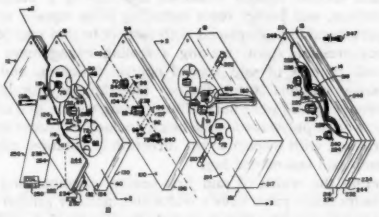
ROTARY ENGINE

Earl G. Bunce, 223-1 Queensbury Dr., Huntsville, Ala. 35802

Filed Jul. 5, 1983, Ser. No. 510,654

Int. Cl.³ F02B *53/08*

U.S. Cl. 123—238 **1 Claim**



1. A rotary internal combustion engine comprising:

a centrally positioned main drive shaft and first and second auxiliary shafts, each said auxiliary shaft located parallel to and spaced a discrete distance from said main drive shaft;

a compression assembly comprising:

a first housing including a first central chamber and first and second end chambers in opposite end regions of said first housing and opening into said first central chamber,

a compression rotor mounted on said main shaft within said first central chamber and having a peripheral surface, said compression rotor including three equally spaced curved peripheral lugs making a sealing engagement with wall regions of said central chamber, and said compression rotor further including a like plurality of evenly spaced peripheral slots opening to one side and adjacent to the forward, with respect to the direction of rotation of said compression rotor, edge of each said lug,

a first sealing rotor mounted on said first auxiliary shaft within said first end chamber and having an outer peripheral surface in sealing engagement with wall regions of said first end chamber, said first sealing rotor including two oppositely positioned slots, a said slot of said first sealing rotor being adapted to mesh with a said lug of said compression rotor,

a second sealing rotor mounted on said second auxiliary shaft within said second end chamber and having an outer peripheral surface in sealing engagement with wall regions of said second end chamber, said second sealing rotor including two oppositely positioned slots, a said slot of said second sealing rotor being adapted to mesh with a said lug of said compression rotor, and

a first compression chamber in said first central chamber formed between said first and second sealing rotors and between one side of said first housing and said compression rotor, and a second compression chamber formed in said first central chamber between said first and second sealing rotors and between the opposite side of said first housing and said compression rotor;

said slots of said first and second sealing rotors being configured of curved surfaces including a bottom or inner-most convex surface and a pair of opposite, like, side wall surfaces, each side wall surface having a concave region and a convex region, said bottom convex surface extending between the inner extremity of each concave region of each said side wall surface, and said convex region of each said side wall extending between said peripheral surface of said sealing rotor and each of said concave regions;

said lugs of said compression rotor being configured of curved

surfaces including an outermost or top convex surface and a pair of opposite, like convex side walls having one end intersecting with said top convex surface and an opposite end intersecting with said peripheral surface of said compression rotor, said top convex surface being in sealing engagement with said wall region of said central chamber;

a power impulse assembly comprising:

a second housing including a second central chamber and third and fourth end chambers located in opposite end regions of said second housing and opening into said central chamber,

a power impulse rotor mounted on said main shaft within said second central chamber and having a peripheral surface, said power rotor including three equally spaced peripheral lugs, displaced with respect to said lugs of said compression rotor, making a sealing engagement with wall regions of said second central chamber, and said power impulse rotor further including a plurality of evenly spaced peripheral slots opening to one side of said power impulse rotor and being located adjacent to the trailing, with respect to the direction of rotation, edge of each said last-named lug,

wherein the width of said first central chamber and said compression rotor have a width substantially greater than twice the width of said second central chamber and said power impulse rotor,

a third sealing rotor mounted on said first auxiliary shaft within said third end chamber and having an outer peripheral surface in sealing engagement with wall regions of said third end chamber, said third sealing rotor including two oppositely positioned slots, a said slot of said third sealing rotor being adapted to mesh with a said lug of said power impulse rotor,

a fourth sealing rotor mounted on said second auxiliary shaft within said fourth end chamber and having an outer peripheral surface in sealing engagement with wall regions of said fourth end chamber, said fourth sealing rotor including two oppositely positioned slots, a said slot of said fourth sealing rotor being adapted to mesh with a said lug of said power impulse rotor, and

a first power chamber formed between said third and fourth sealing rotors and between one side of said second housing and said power impulse rotor, and a second power chamber formed between said third and fourth sealing rotors and between the opposite side of said second housing and said power impulse rotor;

wherein said slots in said third and fourth sealing rotors are configured similarly as said slots in said first and second sealing rotors, and said lugs on said power rotor are configured similarly as said lugs on said compression rotor;

said compression rotor being three-halves the diameter of said first and second sealing rotors, and said power impulse rotor being three-halves the diameter of said third and fourth sealing rotors;

timing means for interconnecting said main shaft and said first and second auxiliary shafts and synchronized for engagement of said lugs and slots;

fuel source means comprising a first inlet through said first housing into said first compression chamber adjacent to said first sealing rotor, and a second inlet to said first housing into said second compression chamber adjacent to said second sealing rotor;

gas coupling means comprising a first channel extending from a region of said first compression chamber opposite a circumferential position of said slot in said compression rotor as said compression rotor rotates by said first channel which is adjacent to said second sealing rotor and extending to a region of said second power chamber adjacent to said fourth sealing rotor, and a second channel extending from the region of said second compression chamber opposite the radial position of a said slot in said compression rotor as it rotates past said second channel adjacent to said first sealing rotor to a region of said first power chamber adjacent to said third sealing rotor;

exhaust means comprising a first outlet through said second housing from a region of said first power chamber adjacent to said fourth sealing rotor, and a second outlet through said second housing from a region of said second power chamber adjacent to said third sealing rotor;

said bottom convex surface in both said slots in each of said first and second sealing rotors in said compression assembly defines an arc on a first circle having a radius from the center of each said sealing rotor equal to the value of one-half lug height, RL, subtracted from two-thirds RPC, the radius of the pitch circle of said compression rotor, said two-thirds RPC being RPC′ and being the radius of the pitch circle of each said sealing rotor;

said concave regions of said side wall surfaces of both said slots in each of said first and second sealing rotors in said compression assembly defining oppositely positioned arcs on a second circle having a radius equal to the product RL′ of RL times a multiplier which has a range from 1 1/16 to 1¼, and said second circle being centered on said pitch circle of each said sealing rotor and overlapping said first circle;

said convex regions of said side wall surfaces of both said slots in each of said first and second sealing rotor in said compression assembly define arcs along third and fourth circles centered on said pitch circle of each of said sealing rotor, and on opposite sides of said second circle, said third circle having a center point spaced a distance equal to the value of the diameter of said second circle, and away from a first point of intersection between said sealing rotor pitch circle and said second circle, and said fourth circle having a center point spaced a distance equal to the diameter of said second circle from a second point of intersection between said sealing rotor pitch circle and said second circle, said convex regions of said side wall surfaces extending along said third and fourth circles, respectively, between said pitch circle and said outer periphery surface of each said sealing rotor;

said top convex surface of each said lug on said compression rotor defining an arc on a fifth circle having a radius from the center of said main shaft equal to the sum of RPC plus RL;

said opposite like convex side walls on each said lug on said compression rotor define opposite arcs on said second circle between said fifth circle and said outer periphery surface of said compression rotor; and

said slots in said third and fourth sealing rotors in said power assembly being configured as said slots in said first and second sealing rotors, and said lugs on said power impulse rotor being configured as said lugs on said compression rotor.

4,512,303

IGNITION TIME CONTROLLING DEVICE IN CONTACTLESS IGNITION DEVICES FOR INTERNAL COMBUSTION ENGINES

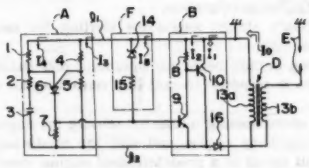
Hiromi Watanabe, Kanagawa, Japan, assignor to Oppama Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Apr. 26, 1983, Ser. No. 488,788

Claims priority, application Japan, Nov. 2, 1982, 57-193064; Dec. 3, 1982, 57-212504

Int. Cl.³ F02P *3/08, 5/04*

U.S. Cl. 123—335 **4 Claims**



1. An ignition timing control for a contactless ignition de-

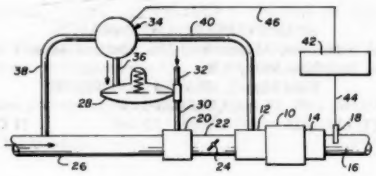
vice for internal combustion engines comprising a trigger circuit having a programmable unijunction transistor which will be ON when the primary short-circuiting current of an ignition coil is at or a little past its peak, a charging and discharging circuit for the primary short-circuiting current, a switching controlling circuit interrupting the primary short-circuiting current when said trigger circuit is ON, an ignition coil inducing a high voltage in a secondary winding when the primary short-circuiting current is interrupted by said switching controlling circuit, a spark plug generating a spark on receiving the high voltage of the above mentioned secondary winding and an angle advancing circuit connected between said programmable unijunction transistor and said switching controlling circuit, said angle advance circuit breaking over at a set value of the primary short-circuiting current or the voltage on the primary winding of the ignition coil and operating the switching controlling circuit prior to the operation of said programmable unijunction transistor.

4,512,304

METHOD AND APPARATUS FOR CONTROLLING AIR TO GAS RATIO IN GAS ENGINES

Warren E. Snyder, Dousman, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 20, 1983, Ser. No. 543,722
Int. Cl.³ F02M 7/00
U.S. Cl. 123—344 **10 Claims**



1. Improved apparatus for controlling the air to gas ratio of fuel being supplied to a gas engine that includes intake and exhaust manifolds connected to the engine, a carburetor having an air inlet and having an outlet connected to the intake manifold, and a gas regulator connected to the carburetor for controlling the pressure of gas to the carburetor, said improved apparatus comprising:

conduit means connecting the air inlet with the intake manifold;

actuating means located in said conduit means and connected to said regulator, said actuating means providing an output signal to said regulator that has a magnitude equal to or between the pressure in said inlet and the pressure in said intake manifold for actuating said regulator to supply the desired rate of flow of gas to said carburetor; and,

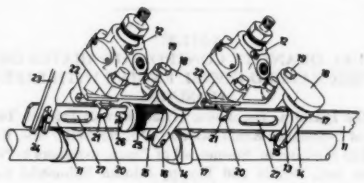
intelligence means connected to said regulator actuating means for transmitting a signal to said actuating means whereby said actuating means causes said regulator to provide the desired rate of flow of gas to said carburetor and the desired air to gas ratio of fuel supplied to said engine.

4,512,305

DELIVERY-REGULATION UNIT FOR IN-LINE INJECTION PUMPS

Luigi Pitozzi, Brescia, Italy, assignor to SAME S.p.A., Treviglio, Italy

Filed Oct. 7, 1983, Ser. No. 539,946
Claims priority, application Italy, Oct. 11, 1982, 23142/82[U]
Int. Cl.³ F02D 31/00
U.S. Cl. 123—364 **2 Claims**



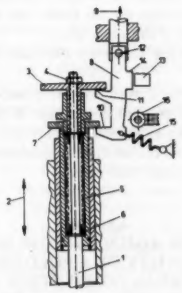
1. A delivery-regulation unit for in-line injection pumps arranged with parallel axes in an engine bed, particularly for multi-cylinder Diesel engines, comprising a reciprocating rod arranged adjacent to individual injection pumps, and pump governor means for each of said injection pumps, said pump governor means each comprising a rack slidably supported by the respective injection pump outside thereof and substantially tangentially thereto for controlling fuel injection thereof, wherein said rod has slots adjacent to the injection pumps and each rack is connected to a respective one of said slots by a swivel joint means to allow adjustment of said pumps individually by angular displacement thereof about their axes.

4,512,306

DEVICE FOR SHUTTING DOWN A FUEL INJECTION COMBUSTION ENGINE

Georg Brasseur, Vienna, and Heinz Rathmayr, Hallein, both of Austria, assignors to Friedmann & Maier Aktiengesellschaft, Hallein, Austria

Filed Jul. 8, 1983, Ser. No. 512,026
Claims priority, application Austria, Jul. 9, 1982, 2686/82
Int. Cl.³ F02D 31/00
U.S. Cl. 123—367 **9 Claims**



1. A device for shutting down a fuel injection combustion engine, in which a fuel amount control rod of an injection pump cooperates with an adjustable stop adapted to be locked, in operation, by a locking member in a position giving free the whole adjusting range of the fuel amount control rod and being acted upon in its locked position by a shut-down spring in the sense of moving the fuel amount control rod to zero-delivery, the locking member being releasable in dependence on an operating condition, characterized in that an adjusting member

for adjusting the fuel amount is actuated by a servometer and acts on the fuel amount control rod with interposition of a drag spring, in that the lockable stop is connected with a further stop cooperating, on adjusting the adjusting member in direction of maximum fuel supply of the fuel amount control rod, with a counterstop of the adjusting member, the shut-down spring thereby being tensioned until engagement of the locking member is the lockable stop, and in that in operation the further stop is out of engagement with the counterstop of the adjusting member.

4,512,307

FUEL QUANTITY CONTROL APPARATUS OF SUPERCHARGED DIESEL ENGINE WITH SAFETY MEASURES

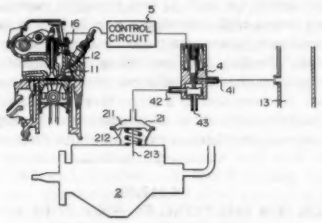
Toshihiko Igashira, Toyokawa; Hisasi Kawai; Takeshi Tanaka, both of Toyohashi; Kenzi Iwamoto, Nishio; Seiko Abe, Kariya, and Eiji Hashimoto, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 15, 1982, Ser. No. 398,712

Claims priority, application Japan, Jul. 18, 1981, 56-111547

Int. Cl.³ F02D *1/04*; F02M *39/00*

U.S. Cl. 123—383 **4 Claims**



1. A fuel quantity control apparatus for a supercharged diesel engine, having a glow plug, an electric circuit for preheating the glow plugs and a fuel injection pump capable of increasing the fuel quantity according to the degree of supercharging, said apparatus comprising:

means for detecting at least an abnormal temperature by measuring the electric resistance of the glow plug using a bridge circuit including a diode provided to electrically separate said bridge circuit from said electric circuit for the preheating of the glow plug,

a control circuit for receiving the output of the detection means, and

a three-way valve driven by the control circuit and for controlling the amount of increase of the fuel quantity,

whereby when the abnormal temperature is detected by the detection means, the amount of increase of the fuel quantity is made zero or decreased.

4,512,308

DEVICE FOR ADJUSTING THE FULL-LOAD INJECTION QUANTITY OF A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Gerald Höfer, Weissach-Flacht; Max Straubel, and Franz Eheim, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,816

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146132

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—383 **15 Claims**

1. A device for adjusting the full load injection quantity of a fuel injection pump for internal combustion engines including a fuel quantity adjusting member arranged to traverse a travel and means associated therewith for varying said travel which comprises:

an injection pump housing;

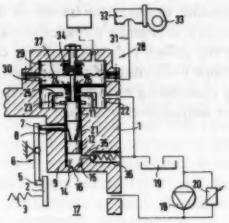
a piston chamber in said injection pump housing;

an adjusting piston in said piston chamber;

a restoring spring positioned relative to and operative to apply a counterforce on one end of said adjusting piston;

a pressure source which is varied according to rpm;

a work chamber defined by one end of said piston and said piston chamber which communicates with said pressure source to provide a fluid under pressure in said work



chamber according to rpm of said fuel injection pump against said counterforce on one end of said adjusting piston;

transmission means operatively related to said adjusting piston and to said means for varying said travel for adjusting said means relative to any movement of said adjusting piston in said piston chamber, and

means for restricting travel of said adjusting piston in accordance with operating parameters of said combustion engine including the density of air delivered to said combustion engine.

4,512,309

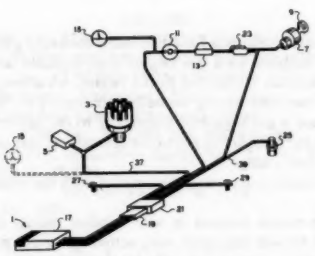
SPARK CONTROL APPARATUS

Chusak Tansuwan, Manchester, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed May 2, 1983, Ser. No. 490,974

Int. Cl.³ F02B *5/04*

U.S. Cl. 123—425 **21 Claims**



1. A spark control apparatus for an internal combustion engine using either a breaker point or solid state ignition system, the apparatus controlling current to an ignition coil and comprising:

means for converting the waveform of the current signal from the ignition system to a predetermined waveform;

means for sensing engine vibration and for generating an electrical signal representative thereof;

means for processing the electrical signal to determine engine knock by comparing the peak and average values of the electrical signal;

means for delaying termination of current to the ignition coil as a function of the comparison of the peak and average values of the electrical signal;

driver means responsive to the ignition signal for controlling current to the ignition coil; and,

means for shutting off the driver means when the engine is not running thereby to prevent application of current to the ignition coil and reduce current drain, the shut-off means including first switching means which is normally off when the engine is not running, second switching means which turns off the driver means when on and control means controlling the second switch means to turn it on when the engine is not running, the shut-off means being responsive to changes in the operating state of the first switching means to switch the operating state of the second switching means, the first switching means including a solid-state device responsive to the predetermined current waveform to switch between on and off operating states when the engine is running and to remain in its off state when the engine is not running, the second switching means including a second solid-state device connected between the input to the driver means and electrical ground, the solid-state device, when on, electrically grounding the driver means input thereby shutting it off, and the controlling means including a capacitor having a discharge path in which the first said solid-state device is connected and a third solid-state device whose operating state is determined by the charge level of the capacitor, the third solid-state device being connected to the second solid-state device to control the operating state thereof, the first said solid-state device, when on, discharging the capacitor and maintaining the third solid-state device in its off operating state and the third solid-state device, in turn, keeping the second solid-state device off, and the first said solid-state device, when off, causing the capacitor to charge to a level at which the third solid-state device is turned on to, in turn, turn the second solid-state device on.

4,512,310

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

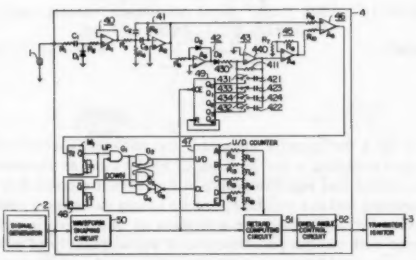
Hiroshi Haraguchi, Oobu, and Ko Narita, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 29, 1982, Ser. No. 427,818

Claims priority, application Japan, Sep. 30, 1981, 56-155214

Int. Cl.³ F02P 5/04

U.S. Cl. 123—425 **5 Claims**



1. An ignition timing control system for internal combustion engines including a knocking detector for detecting the knocking of the internal combustion engine caused, a control unit for generating an ignition timing control signal in accordance with an output signal produced from said knocking detector, and an ignitor for generating an ignition signal in response to the ignition timing control signal, wherein

said control unit comprises a cylinder switching signal generator for generating a cylinder switching signal in synchronism with the rotation of the engine, a plurality of integrating means corresponding in number to a group of cylinders for generating reference signals in response to the signal produced from said knocking detector, switching means for selecting one of the reference signals of said integrating means in response to said cylinder switching signal, and comparing means for deciding the presence or absence of a knock in response to the signal produced from said knock detector and the selected one of the reference signals produced from said integrating means.

4,512,311

INTAKE CONTROL SYSTEM FOR MULTI-VALVE TYPE INTERNAL COMBUSTION ENGINE

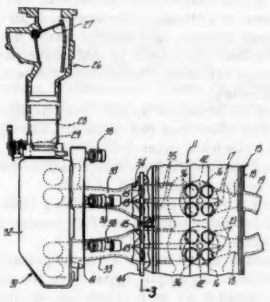
Keiichi Sugiyama, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Continuation of Ser. No. 312,673, Oct. 19, 1981, abandoned. This application Mar. 2, 1984, Ser. No. 588,358

Claims priority, application Japan, Oct. 20, 1980, 55-147150

Int. Cl.³ F02D 9/08

U.S. Cl. 123—432 **11 Claims**

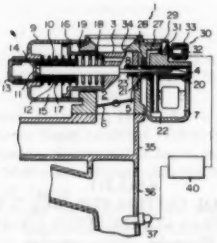


1. In an induction system for a chamber of an internal combustion engine having inlet means communicating with said chamber, for delivering a charge thereto, main throttle valve means in said inlet means for controlling the flow therethrough, exhaust means communicating with said chamber for receiving a burnt charge therefrom, means for controlling the communication of said inlet means and said exhaust means with said chamber for providing for opening of said inlet means prior to full closure of said exhaust means, the improvement comprising means for limiting the effective area of said inlet means during idle for minimizing the backflow of exhaust products into said inlet means when said inlet means and said exhaust means are both open and for reducing said restriction when said engine is in an off idle condition comprising a control valve means in said inlet means downstream of said main throttle valve means and means for commencing the opening of said control valve means immediately upon opening said main throttle valve past its idle condition, said means for opening said control valve means comprises linkage means interconnecting said control valve means with said main throttle valve and adapted to open said control valve means at a faster rate than said main throttle valve is opened so that said control valve means is in its fully open position prior to full opening of said main throttle valve.

4,512,312
VARIABLE VENTURI-TYPE CARBURETOR

Norihiko Nakamura; Takaaki Itou; Takashi Katou, all of Mishima; Masatami Takimoto, and Mitsuyoshi Teramura, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 10, 1983, Ser. No. 465,658
Claims priority, application Japan, May 18, 1982, 57-082408
Int. Cl.³ F02M *7/18*
U.S. Cl. 123—439 **6 Claims**



1. A variable venturi-type carburetor of an internal-combustion engine having a cylinder, an exhaust passage, and an oxygen concentration detector arranged in the exhaust passage, said carburetor comprising:

an intake passage formed in the carburetor;

a suction piston transversely movable in said intake passage in response to a change in the amount of air flowing within said intake passage, said suction piston having a tip face which defines the venturi in said intake passage;

a fuel passage extending transversely and being open to said intake passage;

a metering jet arranged in said fuel passage and having a cylindrical inner wall and an air-outflow opening formed on said cylindrical inner wall;

an air-bleed passage through which said air-outflow opening is open to the outside air;

an auxiliary air-bleed passage branching from said air-bleed passage and being open to said fuel passage downstream of said metering jet;

valve means arranged in said air-bleed passage and actuated in response to an output signal from the oxygen concentration detector so as to keep the air-fuel ratio of the mixture fed into the cylinder equal to a predetermined ratio; and

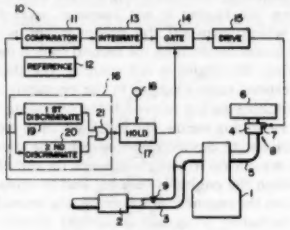
a needle fixed onto the tip face of said suction piston and having a cross-sectional area which increases in the direction f the tip face of said suction piston, said needle extending through said fuel passage and said metering jet and partially covering said air-outflow opening so as to reduce the flow are of said air-outflow opening in accordance with a reduction in the amount of air fed into the cylinder.

4,512,313
ENGINE CONTROL SYSTEM HAVING EXHAUST GAS SENSOR

Tsuyoshi Tsuchida; Yoshinobu Kido; Hideki Kakumoto, and Yuzuru Tanaka, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 3, 1983, Ser. No. 500,918
Claims priority, application Japan, Jun. 4, 1982, 57-96849; Jun. 4, 1982, 57-96848
Int. Cl.³ F02M *7/12*
U.S. Cl. 123—440 **5 Claims**

1. An internal combustion engine including an intake system for drawing fresh charge of intake gas to the engine, an exhaust system for exhausting combustion gas from the engine as an exhaust gas, and an engine control system, said engine control system including exhaust gas sensing means provided in said exhaust system of the engine for producing an electric signal which corresponds to concentration of a constituent in the engine exhaust gas, regulating means for regulating at least one factor which affects operating conditions of the engine, control means for receiving said electric signals from the sensing means to calculate rate of change in a unit time of said electric signal when the sensing means is being warmed-up and produce a control signal for controlling said regulating means

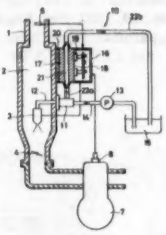


after the rate of change of said electric signal has become greater than a predetermined value, said control means including means for producing a sensor activated signal when the rate of change of said electric signal exceeds the predetermined value, and signal hold means for maintaining the sensor activated signal until the engine is stopped so that the control signal is produced even when the rate of change is decreased.

4,512,314
FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Toshiyuki Sakamoto, and Seiji Wataya, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 10, 1982, Ser. No. 448,864
Claims priority, application Japan, Jan. 14, 1982, 57-5625
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—459 **1 Claim**

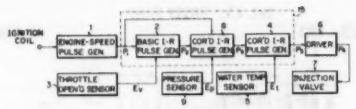


1. In a fuel control apparatus for an internal combustion engine including a fuel tank, an air intake tube, an electrically controlled fuel injection valve, a fuel pressure controller for supplying fuel at a constant pressure to said valve and a control device for controlling the operation of said valve in accordance with various parameters such as the quantity of incoming air to said engine and the temperature of said engine, the improvement comprising heat insulating means and said control device being provided with a radiating fin for dissipating the heat generated by said control device and fuel passage means contacting said fin to assist in cooling said fin, and conduit means connecting opposite ends of said fuel passage means to said fuel pressure controller and said fuel tank respectively, said fuel injection valve, said fuel pressure controller and said control device being installed on said intake tube and said heat insulating means being interposed between said intake tube and said fin.

4,512,315
ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Naoki Tomisawa, Isesaki, Japan, assignor to Japan Electronic Control Systems Company, Limited, Japan

Filed Oct. 20, 1982, Ser. No. 435,378
Claims priority, application Japan, Oct. 21, 1981, 56-168361
Int. Cl.³ F02M *51/02*
U.S. Cl. 123—478 **7 Claims**



1. An electronically operated fuel injection system for actuating injector means provided at an air induction passage of an internal combustion engine, said induction passage being provided with a throttle valve operable to open to varying degrees and a supercharging means mounted upstream of said throttle valve, comprising:

engine speed sensor means for producing an engine speed signal representative of the engine speed of said engine;

throttle opening sensor means for producing a throttle opening signal representative of the opening degree of the throttle valve;

basic injection-rate pulse generating means for producing basic injection-rate pulses indicative of a basic fuel injection rate in response to said engine speed signal and said throttle opening signal;

air-pressure sensor means for producing an air pressure signal representative of the air pressure downstream of said supercharging means but upstream of said throttle valve;

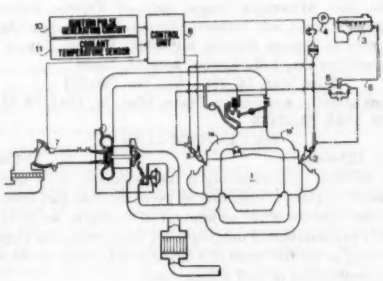
a corrected injection-rate pulse generating means for correcting said basic injection-rate pulses in accordance with said air-pressure signal; and

an actuator for actuating said injector means in response to the corrected basic injection-rate pulses.

4,512,316
FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kenji Mochizuki, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,467
Claims priority, application Japan, Oct. 1, 1982, 57-173630
Int. Cl.³ F02M *51/00*; F02B *3/00*
U.S. Cl. 123—478 **14 Claims**



1. A fuel injection system for an internal combustion engine, wherein

the engine having adjacent cylinders provided with intake valves, the adjacent cylinders and the intake valves undergoing a periodic operation cycle dependent on engine speed with timewise partially overlapping opening times of said intake valves, the fuel injection system comprising

a common intake manifold communicating the adjacent cylinders with each other,

respective fuel injection valves for said cylinders respectively disposed in said common intake manifold,

control means for producing a fuel injection signal once each operation cycle of the communicating adjacent cylinders for simultaneously opening the fuel injection valves for the communicating adjacent cylinders,

means for detecting the engine speed and for producing a first signal dependent thereon, and

said control means including:

means comprising a fuel injection time computing circuit responsive to said first signal of said detecting means for producing a second signal, and

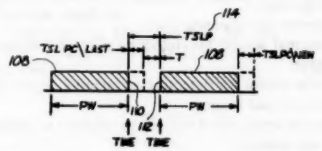
computing means responsive to said second signal for producing a fuel injection time delay signal providing a time delay of said fuel injection signal after ignition time of a first of the communicating adjacent cylinders, and

said control means for decreasing the time delay with increase of the engine speed, and for providing said time delay during low engine speed below a predetermined engine speed so as to inject fuel after all of said intake valves of the communicating adjacent cylinders have closed and for making said time delay zero during high engine speed at least equal to said predetermined engine speed so as to inject the fuel at said ignition time of the first of the communicating adjacent cylinders.

4,512,317
EXTENDED RANGE THROTTLE BODY FUEL INJECTION SYSTEM

Michael A. Pauwels, Williamsburg; Danny O. Wright, Grafton, both of Va.; Bruce J. Harvey, Sterling Heights, Mich., and Thomas J. Bauer, Newport News, Va., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 27, 1984, Ser. No. 584,025
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—478 **4 Claims**



1. An extended range throttle body fuel injection system utilizing injection means for injecting fuel into an engine, comprising:

a microprocessor having a plurality of control laws stored therein and responsive to at least one engine operating condition and in accordance with said control laws for generating a series of pulse width signals representing an amount of fuel to be injected into the engine said pulse width signal including a compensation time component and a calculated time component;

timer means responsive to the trailing and leading edges of said pulse width signals to measure the time between successive pulse width signals;

first means for subtracting from the value in said timer means said compensation time component associated with the previous fuel pulse for determining a net time value between the previous fuel pulse and the present fuel pulse;

comparison means responsive to said net time value for comparing said net time value between successive pulse width signals with a predetermined time value;

means responsive to said comparison means to generate a new compensation time value signal as a function of said net time value; and

second means for subtracting said compensation time value signal from said pulse width signal to generate a compensated pulse width signal.

4,512,318

INTERNAL COMBUSTION ENGINE WITH FUEL INJECTION SYSTEM

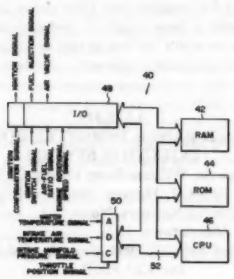
Toshimitsu Ito, and Toshiaki Isobe, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 16, 1982, Ser. No. 418,838

Claims priority, application Japan, Sep. 18, 1981, 56-147314

Int. Cl.³ F02D *5/02*

U.S. Cl. 123—492 **12 Claims**



1. An internal combustion engine with a fuel injection system comprising:

an injector for injecting fuel;

a rotational sensor for detecting a rotational speed of said engine;

a throttle sensor for detecting an opening degree of a throttle valve of said engine;

a pressure sensor for detecting pressure in an intake manifold of said engine;

first calculating means for calculating a basic injection time period, during which said injector injects fuel, based on the engine rotational speed detected by said rotation sensor and intake manifold pressure detected by said pressure sensor;

second calculating means for calculating a change with time of said opening degree detected by said throttle sensor and a change with time of said intake manifold pressure detected by said pressure sensor; and

correcting means for correcting said basic injection time period under acceleration of said engine by alternatively using a first value effective when the increasing change of the opening degree of the throttle valve exceeds a first level and a second value effective when the increasing change of the intake manifold pressure exceeds a second level, said first value being large enough to provide a quick engine response and being attenuated when the change of the opening degree of the throttle value is below the first level and said second value being used to correct the basic injection time period only after the first value is below the second value.

4,512,319

INTERNAL COMBUSTION ENGINE

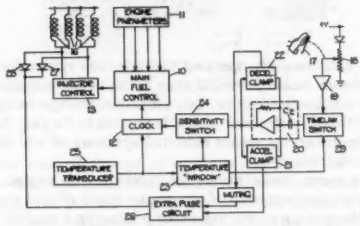
Malcolm Williams, Solihull; Albert R. Tingey, Whitacre Heath; John P. Southgate, Braunton, Nr. Barnstable, and Steven J. Russell, Coventry, all of England, assignors to Lucas Industries Limited, England

Continuation of Ser. No. 470,139, Feb. 28, 1983, abandoned, which is a continuation of Ser. No. 847,622, Nov. 1, 1977, abandoned. This application Nov. 23, 1983, Ser. No. 554,756

Claims priority, application United Kingdom, Nov. 4, 1976, 45862/76

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—492 **11 Claims**



1. An electronic fuel injection control for an internal combustion engine comprising a main fuel control circit sensitive to at least one engine parameter and determining the rate at which fuel is supplied to the engine, said main fuel control circuit including demand means for generating a demand signal which influences the rate at which fuel is injected, said fuel injection control further comprising a transient enrichment control circuit operative during acceleration to provide a temporary increase in the rate of fuel supplied, the magnitude of the temporary increase in the rate of fuel supply being substantially proportional to the rate of change of said demand signal, a sensitivity switch circuit being incorporated in said transient enrichment control circuit and arranged to select one of a plurality of discrete values for a constant of proportionality of said temporary increase thereof and temperature sensitive means sensitive to engine temperature and connected to control said sensitivity switch circuit, said sensitivity switch circuti being effective to modify the effect of said transient enrichment control circuit by selecting one of said discrete values in accordance with engine temperature.

4,512,320

METHOD OF AND DEVICE FOR CONTROLLING FUEL INJECTION IN INTERNAL COMBUSTION ENGINE

Shinichi Abe; Mitsuharu Taura, both of Toyota; Hidetoshi Amano, Okazaki, and Toshiaki Mizuno, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 15, 1984, Ser. No. 590,051

Claims priority, application Japan, Mar. 28, 1983, 58-52187; Mar. 28, 1983, 58-52188

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—492 **23 Claims**

1. A method of controlling a fuel injection in an internal combustion engine for effecting an asynchronous fuel injection from a fuel injector when an amount of an engine acceleration exceeds a predetermined judging level, comprising the steps of:

detecting an air-fuel ratio of a mixture as an index of the state of combustion in said engine; and

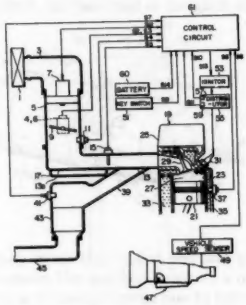
controlling said judging level in accordance with said air-fuel ratio thus detected such that said judging level is raised as said air-fuel ratio gets smaller.

2. A device for controlling a fuel injection in an internal combustion engine comprising:

an acceleration detecting means for detecting an amount of acceleration of said engine;

an air-fuel ratio detecting means for detecting an air-fuel ratio as an index representing the state of combustion in said engine;

a judging means adapted to make a judgement as to whether an asynchronous fuel injection by an injector is necessary in accordance with a judging level and to allow the asynchronous fuel injection when the amount of engine acceleration exceeds said judging level;



a judging level changing means adapted to control said judging level in accordance with air-fuel ratio detected by said air-fuel ratio detecting means such that said level is raised as said air-fuel ratio becomes smaller; and

a signal generating means adapted to generating an injection signal for driving said injector for a predetermined time length when said asynchronous fuel injection is allowed by said judging means.

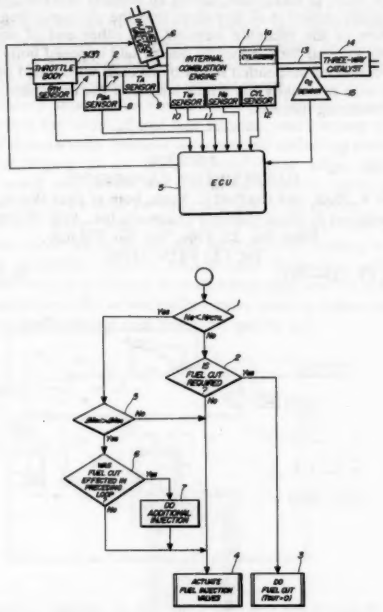
4,512,321

FUEL SUPPLY CONTROL METHOD FOR MULTI CYLINDER INTERNAL COMBUSTION ENGINES AFTER TERMINATION OF FUEL CUT

Akihiro Yamato, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,998
Claims priority, application Japan, Jun. 15, 1983, 58-107548
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—493 **5 Claims**

1. A method of controlling the supply of fuel to an internal combustion engine having a plurality of cylinders at deceleration thereof, wherein operating conditions of said engine are detected, the quantity of fuel being supplied to said engine is set to a value appropriate to a detected operating condition of said engine upon generation of each pulse of a trigger signal, sequential injections of the set quantity of fuel are effected into said cylinders in predetermined sequence in synchronism with generation of pulses of said trigger signal, and the supply of fuel to said cylinders is interrupted when said engine is decelerating in a predetermined operating condition, the method comprising the steps of: (1) determining whether or not a predetermined condition for terminating the interruption of the fuel supply to said engine is satisfied; and, (2) when said predetermined condition is determined to be satisfied, effecting one of said sequential injections into one of said cylinders which corresponds to a present pulse of said trigger signal at the time of generation of said present pulse of said trigger signal, and simultaneously effecting an additional injection into



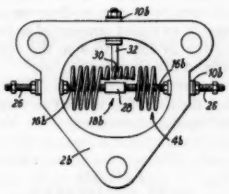
another one of said cylinders which corresponds to an immediately preceding pulse of said trigger signal.

4,512,322

ENGINE PREHEATERS

Michael F. Barcy, Tadworth, England, assignor to CT Harwood Limited, London, England

Filed Jul. 12, 1982, Ser. No. 397,069
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—549 **15 Claims**



1. In an air-breathing internal combustion engine having at least one combustion air-inlet conduit providing an air path between transversely opposed walls, the improvement consisting of an air-heating device in said conduit comprising an electrical resistance element in the form of a helical coil extending transversely across said air path and a substantially rigid electrically conductive retaining member for said element, said device including support means for mounting said retaining member, said support means comprising a one-piece carrier body attached to the air-inlet conduit and having an opening through it and between opposed body walls to form a part of the air-inlet conduit, said member being (1) connected to one end of the coil and (2) directed through the coil interior

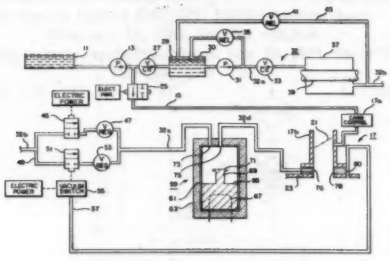
and (3) extending across said opening and (4) being secured to said opposed body walls, said member providing a support for at least said one end of the resistance element, the coil comprising a series of turns each having an internal cross-section substantially greater in all directions than the corresponding cross-section of the retaining member, the other end of said coil being adapted for support by one of said opposed body walls, the coil being suspended solely by its ends within said opening and with essentially the whole length of the coil spaced from the retaining member.

4,512,323

CARBURETOR VAPORIZER

John V. Ruth, and Garfield C. Potts, both of Fort Worth, Tex., assignors to Ultra Mileager Company, Inc., Fort Worth, Tex.

Filed Jan. 23, 1984, Ser. No. 573,021
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **10 Claims**



1. A system for vaporizing fuel for an internal combustion engine having a main fuel pump for pumping fuel from a main fuel tank through a main fuel line to a carburetor, comprising in combination:

an auxiliary fuel tank connected to the main fuel pump for receiving fuel pumped by the main fuel pump;

an auxiliary fuel pump having an intake connected to the auxiliary fuel tank and a discharge connected to an auxiliary fuel line;

preheater means for heating the fuel in the auxiliary fuel line with exhaust from the engine;

a vaporizer chamber sealed from the atmosphere and connected to the auxiliary fuel line downstream of the preheater means, the vaporizer chamber having an electrically heated element upon which fuel from the auxiliary line is discharged to create air-free vapor, the vaporizer chamber having an outlet connected to the carburetor for transmitting the air-free vapor to the carburetor for mixing with air and for combustion; and

valve means connected into the main fuel line for preventing flow through the main fuel line when vapor is being delivered by the vaporizer chamber.

4,512,324

FUEL PREHEATER

David Neary, 12716 E. 137 St., Broken Arrow, Okla. 74011, assignor to David Neary, Broken Arrow, Okla.

Filed Apr. 9, 1984, Ser. No. 597,959
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **16 Claims**

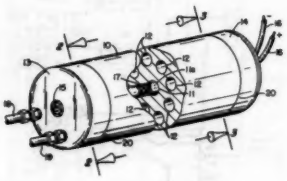
1. A preheater for liquid fuel to be used in a device designed to burn said fuel comprising

a single, unitary cylindrical member provided with a first axially positioned conduit, circular in cross section, extending throughout the entire length of said cylindrical member,

an electrical resistance heating element positioned within said first conduit and electrically insulated therefrom,

a plurality of second conduits, circular in cross section, equi-spaced around and parallel to said first axially positioned conduit and extending throughout the entire length of said cylinder and adapted to carry fuel therein,

means connecting the ends of said plurality of second conduits together so that said second conduits are at least in one series connection, one end of said series connected second conduits being provided with means connecting said one end of said series connected second conduits to a source of fuel and the other end of said series connected second conduits being provided with means connecting said other end of said series connected second conduits to said device designed to burn said fuel, both said means for



connecting said one end of said series connected second conduits to a source of fuel and said means for connecting said other end of said series connected second conduits to said device to burn said fuel being located at the same end of said cylindrical member,

a temperature sensor located in said means connecting said other end of said series connected second conduits to said device designed to burn said fuel and positioned adjacent to said device designed to burn said fuel,

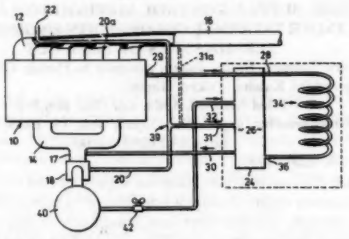
means, responsive to a signal from said temperature sensor, for activating or deactivating said electrical resistance heating element.

4,512,325

EMISSION CONTROL DEVICE

Stephan DePakh, 90 Warren Rd., Suite 110, Toronto, Ontario M4V 2S2, Canada

Filed Mar. 12, 1984, Ser. No. 588,739
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—572 **8 Claims**



1. An improved internal combustion engine including a crankcase ventilation system, an air filter and an intake manifold, wherein the improvement comprises in combination:

means defining a gas-mixing chamber,

a first conduit having one end adapted for connection to the crankcase of the engine and passing in non-communicating fashion through said chamber so that any gases in said chamber contact the outside of the first conduit, the first conduit opening at its other end into said chamber and being such that at least its inner wall is of copper,

a second conduit leading from said chamber and being adapted for communication with said intake manifold,

a third conduit leading from said mixing chamber and receiving a gas which has been heated by exhaust heat, and a fourth conduit leading from said mixing chamber and being adapted for connection to the air filter of the engine.

4,512,326

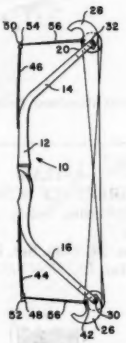
COMPOUND LEVER BOW

David W. Jarrett, 901 Sunset Dr., Lexington, Va. 40502

Filed Apr. 20, 1982, Ser. No. 370,036

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—23 R **4 Claims**



1. A compound lever bow having a center handle and rigid bow limbs having free terminal ends; a lever mechanism rotatably mounted on a pivot point on each of said rigid bow limb terminal ends; said lever mechanisms each including a pulley portion and bowstring levers; said bowstring levers extending a predetermined distance radially outward of the pivot point of said lever mechanisms; a bowstring having respective ends connected to each of said bowstring levers; a synchronizing cable received by said pulley portions; flexible limbs having a strength providing a predetermined shooting force connected to opposite ends of said center handle and having free ends extending outwardly away from the handle; a force cable connecting pin mounted in each of said lever mechanisms; the pins being located a predetermined radial distance from the lever mechanism pivot point; a pair of force cables, each connected to respective of said connecting pins and said flexible limb free ends; and adjustable stop means on one of said rigid limbs in a position engaging said lever mechanism limiting rotation and preventing over-center rotation of said bowstring levers; the strength of said flexible limbs, the mechanical advantage provided by the radial distance between the bowstring lever pivot points and said connecting pins and the positioning of said adjustable stop means all combining whereby a specific bow shooting force is supplied in combination with a predetermined minimal shooting hold force.

4,512,327

MUFFLE OVEN FOR HEATING FOODSTUFFS

Hartmut Stiegler, Herborn, Fed. Rep. of Germany, assignor to Buderus Aktiengesellschaft, Wetzlar, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,932

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3306972

Int. Cl.³ F24C *15/32*

U.S. Cl. 126—21 A **3 Claims**

1. An apparatus for heating foodstuffs, comprising:

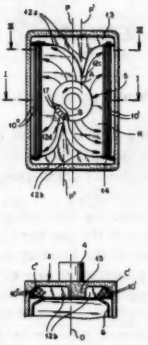
a generally closed housing;

partition means dividing the interior of said housing into a treatment chamber and an air-circulating compartment surrounding said chamber on three sides, said compartment forming a rear air space and two lateral air spaces merging into one another, said partition means having side apertures connecting said lateral air spaces with said chamber and a central opening connecting said chamber with said rear air space;

a radial blower in said rear air space centered on a horizontal axis and driven by an external motor, said blower having an axial intake end aligned with said central opening and having peripheral blades for discharging air in generally radial directions into said rear air space;

stationary upper baffle means above said blower extending across the width of said rear air space and forming a pair of downwardly concave aerodynamic deflecting surfaces converging at an upper flow-dividing edge pointed toward said blower for substantially evenly splitting an ascending air flow between said lateral air spaces;

stationary lower baffle means below said blower extending across the width of said rear air space and forming a pair of upwardly concave aerodynamic deflecting surfaces converging at a lower flow-dividing edge pointed toward said blower for substantially evenly splitting a descending air flow between said lateral air spaces; and



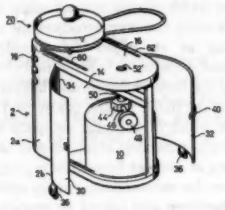
heating means disposed in said compartment in the paths of air streams directed by said blower together with said upper and lower baffle means into said lateral air spaces for circulation through said chamber by way of said apertures and said central opening, said deflecting surfaces being nearly tangent at said flow-dividing edges to two mutually parallel planes substantially coinciding with the flow direction of air leaving said blower at peripheral locations respectively confronted by said flow-dividing edges, said mutually parallel planes being vertical and lying on opposite sides of a vertical plane of symmetry of said housing including the axis of said blower, said mutually parallel planes having a spacing less than the diameter of said blower and a spacing each from said plane of symmetry less than the radius of said blower, said pairs of deflecting surfaces being of generally cycloidal configuration leveling off toward upper and lower corners of said rear air space, said upper and lower baffle means being integral forward extensions of a rear wall of said housing, said housing being of generally rectangular horizontal cross-section with rounded inner wall surfaces at junctions of said rear wall with respective sidewalls.

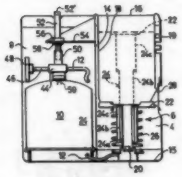
4,512,328

PORTABLE GAS HEATER PARTICULARLY USEFUL FOR HEATING FOODSTUFFS

Yoel Arad, Kibbutz Kfar Blum, D.N., Galil Elyon, Israel

Continuation-in-part of Ser. No. 253,661, Apr. 14, 1981, abandoned. This application Sep. 6, 1983, Ser. No. 529,641
Claims priority, application Israel, Apr. 29, 1983, 68528
Int. Cl.³ F24C *15/10*
U.S. Cl. 126—37 B **29 Claims**





1. A portable gas heater particularly useful for heating foodstuffs, comprising:

a housing including a first section defining a gas burner compartment including a gas burner, and a second section defining a gas container compartment having a fitting for receiving a gas cylinder;

means for interconnecting the fitting to the gas burner for conduction of gas to the gas burner;

said second section of the housing including a pair of side walls hingedly mounted at one end along vertical axes, such that their opposite ends may be pivoted towards each other to a closed position to close said gas container compartment or to an open position to open said gas container compartment;

the bottom of said pair of side walls, when in their open positions, being engageable with a surface supporting the portable gas heater to provide a stable support therefor during use.

4,512,329

HEAT CIRCULATING FIREPLACE GRATE ASSEMBLY FOR GAS FIRED LOGS

Steven W. Sweet, 10470 Metcalf, Overland Park, Kans. 66212

Filed Apr. 13, 1984, Ser. No. 600,007
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **4 Claims**

1. A gas log grate assembly for a fireplace, said grate assembly including,

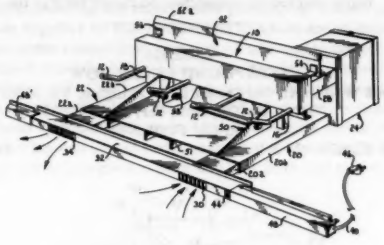
(a) an elongate generally horizontal air manifold having an inlet near one end and an outlet near the other;

(b) means for supporting said manifold between the front and back of the fireplace and spaced above the floor of the fireplace;

(c) an air circulating blower positioned between said manifold and the back of the fireplace;

(d) duct means connected with the inlet to and outlet from said manifold and with said blower and providing for intake of air from outside the fireplace into and through the blower and to said manifold and back from the manifold to outside the fireplace;

(e) means for supporting gas fired logs in close proximity to said manifold; and



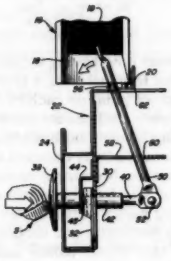
(f) heat shield means disposed between said manifold and said blower.

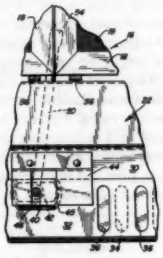
4,512,330

FIREPLACE SCREEN

Bruce T. Larkins, Cookeville, Tenn., assignor to DeSoto, Inc., Chattanooga, Tenn.

Filed Jan. 24, 1983, Ser. No. 460,167
Int. Cl.³ F24C *15/12*
U.S. Cl. 126—139 **11 Claims**





1. A fireplace screen having a frame adapted for association with the face of a fireplace, a damper assembly including a moveable damper member on said frame to regulate the amount of air admitted to a fireplace, and a pair of mesh doors for providing access to a fireplace area,

means pivotally mounting said mesh doors on said frame,

lever means on said frame for engaging the rear of at least one of said mesh doors and for pushing both of said doors open and away from the fireplace, and

manual operating means comprising a damper control knob mounted on said frame and connected both to said moveable damper member and said lever means for operating

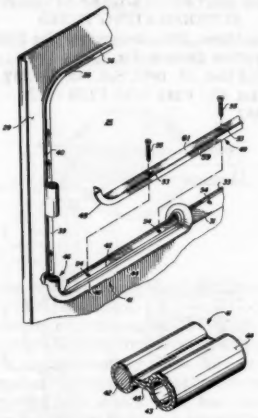
said lever means to push open said mesh doors to gain access to the fireplace, and for moving said damper member.

4,512,331

OVEN SEAL ARRANGEMENT

David E. Levi, Chattanooga, Tenn., assignor to The Maytag Company, Newton, Iowa

Filed May 24, 1984, Ser. No. 613,577
Int. Cl.³ F24C *15/02*
U.S. Cl. 126—190 **13 Claims**



1. An oven seal arrangement, comprising: oven means including a stationary portion defining an oven cavity open at one end and a wall portion adjacent and generally surrounding the open end of said oven cavity, said oven means further including a movable portion in the form of oven door means operable between an open position and a closed position juxtaposed to said wall portion for effectively covering the open end of said oven cavity; flange means associated with said oven means and defining a channel in one of said stationary and movable portions extending along at least a portion of the perimeter of the open end of said oven cavity with said oven door means in said closed position, said channel having a narrow longitudinal opening formed by said flange means and further having seal entry means; and elongated seal means including a retainer portion, a seal portion and an intermediate web portion interconnecting said retainer and seal portions, said retainer and intermediate portions being of effectively smaller cross-section than said channel and said narrow longitudinal opening to be slidably received therein at said seal entry means and to permit longitudinal sliding movement of said elongated seal means relative to said channel for positioning said seal portion in sealing juxtaposition to said stationary and movable portions.

4,512,332

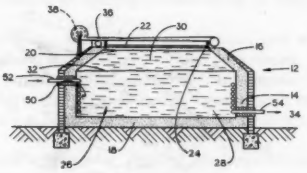
STABLE DENSITY STRATIFICATION SOLAR POND

Fikry L. Lansing, San Gabriel, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 259,208, Apr. 30, 1981, abandoned. This application Oct. 18, 1983, Ser. No. 542,557
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—415 **12 Claims**

1. A stable, density-stratification solar pond comprising:

(a) a cylindrical container having light opaque walls and, in its upper segment, a truncated conical shape converging toward a solar energy acceptance opening facing toward the sun, said opening having an area which is small relative to the surface area of the internal walls of the container, with the ratio of the area of the opening to the surface area of all of the internal walls being in the range of 1/10 to 1/50, and said opening area being no greater than 50% of the projected area of the cylindrical container, said ratio of said aforementioned areas approaching a black-body configuration for said solar pond; and



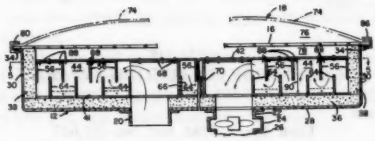
(b) a body of liquids of mutually differing densities disposed within said container, said liquids comprising two separate layers of non-brine, immiscible liquids, the upper layer being organic based and substantially contained within said truncated conical segment, and the lower layer being aqueous based about 80% more dense than said upper layer and essentially contained within said cylindrical container, with the upper layer being transparent to solar radiation and the lower layer being a dark color for high absorptivity of said solar radiation.

4,512,333

SOLAR COLLECTOR PANEL AND METHOD

Wladimir S. King, Mechanicsburg, Pa., assignor to Kimex International Technologies, Inc., Mechanicsburg, Pa.

Filed May 23, 1983, Ser. No. 496,908
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **17 Claims**



1. A solar collector panel comprising a collector plate having one side adapted to be exposed to solar energy, a wall spaced from the other side of the plate, a fluid flow passage between the plate and the wall, a first set of fins spaced along the passage and extending from the plate into the passage and a second set of fins spaced along the passage and extending from the wall into the passage, the second set of fins being located between the fins of the first set, all of said fins being generally parallel, so that fluid flowing through the passage is moved along a serpentine path repetitively toward, into contact with and away from the collector plate for improved transfer of heat from the plate to the fluid.

4,512,334

PORTABLE THERMAL EXCHANGE SYSTEM

Kenneth G. Peachey, Mt. Crawford, Va., assignor to Sunwood Energy Products, Inc., Harrisonburg, Va.

Filed Apr. 28, 1983, Ser. No. 489,462
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—430 **7 Claims**

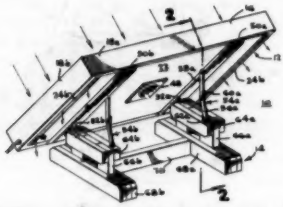
1. Dual functioning apparatus for collecting and storing thermal energy and for serving as a table, said apparatus adapted to be readily moved along a floor surface from a first,

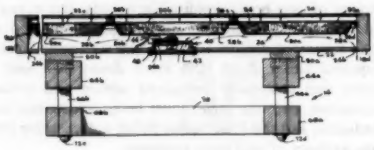
thermal absorbing location to a second, thermal emitting location, said apparatus comprising:

(a) phase change means for selectively absorbing and emitting thermal energy;

(b) base means for supporting said phase change means;

(c) transport means mounted on said base means for facilitating the movement of said base means and said phase change means from the first to the second locations;





(d) a tabletop for receiving and supporting said phase change means and including a plate for presenting a table surface, said plate comprised of a material transmissive to solar radiation, whereby solar radiation may be directed through said plate and onto said phase change means; and

(e) means for adjustably mounting said table top with respect to said base means, whereby said table top may be disposed from a first orientation with respect to the floor surface to a second orientation with respect to the floor surface.

4,512,335

SOLAR ENERGY COLLECTING APPARATUS

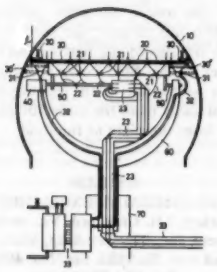
Kei Mori, No. 3-16-3-501,, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 482,027

Claims priority, application Japan, Apr. 3, 1982, 57-55668; Apr. 5, 1982, 57-56215

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—440 **12 Claims**



1. A solar energy collecting apparatus comprising a transparent capsule; a lens assembly comprising a plurality of spot focal point type lenses housed in said capsule and arranged essentially concentrically in order to converge rays of the sun; a sunlight collecting means and solar heat collecting means which are integrated into said lens assembly and provided at the focal point of said lens; a photo conductive cable for transmitting sunlight collected by sunlight collecting means to the desired place; and a heat transmitting device for transmitting the solar heat collected by said heat collecting means to the desired place, said heat collecting means being provided for at least one line of the peripheral side of said lens assembly, and said sunlight collecting means being provided for the remaining lenses at the central portion.

4,512,336

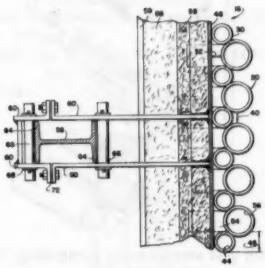
PANEL OF VAPOR GENERATING AND SUPERHEATING TUBES

Murray Wiener, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 14, 1982, Ser. No. 434,219

Int. Cl.³ F24J *3/02*; F22B *37/24*

U.S. Cl. 126—442 **17 Claims**



1. A tube panel comprising at least two parallel vapor generating tubes for receiving radiation energy from forwardly thereof to heat fluid flowing therein to form vapor, each of said vapor generating tubes has a cylindrical outer surface, said cylindrical outer surfaces of said vapor generating tubes are spaced-apart to define a gap having a width, a superheating tube disposed parallel to and contiguous with said cylindrical outer surface of each of said two vapor generating tubes to span said gap for receiving radiation energy from forward of said gap to superheat vapor flowing in said superheating tube, said gap is unobstructed such that insolation may penetrate said gap to be absorbed by said superheating tube, said superheating tube has a diameter which is less than the diameter of either of said vapor generating tubes and is disposed rearwardly of a straight line connecting the centers of said vapor generating tubes such that a major portion of radiation which is emitted by the superheating tube will be absorbed by the vapor generating tubes, and means for supporting said superheating tube in contiguous relation with said vapor generating tubes.

4,512,337

METHODS FOR CRYOPRESERVATION AND TRANSFER OF BOVINE EMBRYOS

Newton G. Leveskis, 8500 Mt. Vernon Rd., Auburn, Calif. 95603

Filed Oct. 20, 1981, Ser. No. 313,118

Int. Cl.³ A61D *7/00, 7/02*

U.S. Cl. 128—1 R **10 Claims**

1. A method for transferring a bovine embryo comprising:

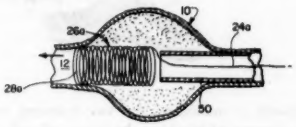
providing a bovine embryo in a physiologically buffered solution, said solution containing a cryoprotective amount of dimethyl sulfoxide, and moving said solution containing the embryo and substantially all of said dimethyl sulfoxide without additional dilution into the uterus of a recipient bovine animal when the animal is apparently receptive to pregnancy.

5. A method for freezing a bovine embryo comprising:
providing a bovine embryo in an initial buffered solution, adding dimethyl sulfoxide at a preselected single concentration within the range of 1–2M", slowly and substantially continuously at a constant rate per minute to said solution until a cryoprotective amount is present therein, and lowering the temperature of said solution sufficiently to preserve the embryo in a viable condition.

4,512,338
PROCESS FOR RESTORING PATENCY TO BODY VESSELS

Alexander B. Balko, 30 Red Barn La., East Greenwich, R.I. 02818, and Dhiraj M. Shah, R.D. #1, Rte. 43, Rensselaer, N.Y. 12144

Filed Jan. 25, 1983, Ser. No. 460,842
Int. Cl.³ A61M *29/00*; A61B *19/00*
U.S. Cl. 128—1 R **15 Claims**

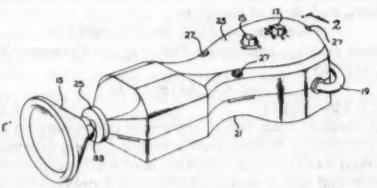


1. The process of restoring the patency and/or re-establish continuity of a disrupted hollow body vessel a patient which includes a localized defect disposed intermediate proximal and distal patent vessel portions, comprising inserting at least the forward end of a shape-memory allow wire having a parent phase and a martensite phase and a temperature transformation point therebetween and which wire has been previously formed in its parent phase to form a longitudinally oriented coil of adjacent wire loops and then cooled to its martensite phase and reshaped to an alternate form before insertion along the interior of said vessel past said defect to a position adjacent the proximal patent vessel portion while maintaining the temperature of said wire below its martensite transformation point and thereafter permitting the forward portion of said wire to be warmed above its transformation point so as to initially cause said alternate form to substantially revert to said parent phase coil form and to cause the thus reformed wire loops of the forward wire end to be urged against the interior of said proximal patent vessel portion so as to be at least temporarily positioned thereat and thereafter permit the reformation of the remainder of said coil so as to bridge said localized defect and extend into said distal patent vessel portion, said warming being progressive in the proximal to distal direction.

4,512,339
PERCUSSOR APPLICATION

Robert C. McShirley, Glendale, Calif., assignor to McShirley Products, Inc., Burbank, Calif.

Filed Apr. 24, 1981, Ser. No. 257,373
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—41 **7 Claims**



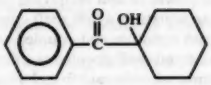
1. In a hand held therapeutic percussor apparatus having an applicator, reciprocal motor means for imparting a reciprocal motion to said applicator, power supply means for controlling the frequency and power of said reciprocal motion, said motor means including an armature, a first shaft coupled at a first end to a first end of said armature and coupled at a second end to said applicator, a second shaft coupled at a first end to a second end of said armature, wherein said first shaft, said second shaft and said armature are substantially aligned along the same longitudinal axis, a means for resiliently holding said armature in a predetermined position, the improvement comprising:
a solenoid having an opening defined along its longitudinal axis;
a magnetic frame substantially surrounding said solenoid, said magnetic frame defined by two pole pieces,
said frame having a single substantially rectangular opening at one end thereof adjacent to said first shaft, such that each said pole piece is separated from said shaft by a preselected distance,
wherein said rectangular opening has approximately the same cross-sectional area as the cross-section of said armature, and wherein the contacting surface of said armature and said solenoid form a bearing surface such that said armature is constrained from rotational movement about its longitudinal axis;
a first resilient bumper disposed on a first end of said second shaft and aligned thereon along the same longitudinal axis as a first bumper stop to impact therewith and to dampen the impact momentum of said first shaft when said second shaft is urged to travel in a first direction when said armature is pulled into the magnetic field formed by said solenoid and said magnetic frame upon the application of an electrical signal to said solenoid;
a second resilient bumper disposed on a second end of said second shaft and aligned thereon along the same longitudinal axis as a second bumper stop to impact with said second bumper stop and to dampen the impact momentum of said first shaft when said second shaft is urged to travel in a second direction upon the removal of said electrical signal from said solenoid; bumper stop;
whereby said first and second bumpers are disposed behind both said applicator and said armature such that said bumpers are outside the area of separation between said pole pieces,
and whereby the said pole pieces have a maximum separation at said one end thereof to provide clearance for the diameter of said first shaft so that said pole pieces will not interfere with the reciprocating travel thereof.

4,512,340
VISIBLE LIGHT CURED ORTHOPEDIC POLYMER CASTS

Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

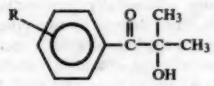
Filed Feb. 22, 1983, Ser. No. 468,434
Int. Cl.³ A61F *13/04*
U.S. Cl. 128—90 **33 Claims**

1. An orthopedic cast material which, when wrapped about a body member and cured by exposure to incandescent visible light which is essentially free of significant actinic radiation in the ultraviolet range of about 200 to 400 nm, forms a rigid, high strength inmobilizing structure and which comprises an air, light and X-ray permeable fabric impregnated with a formulation comprising (a) one or more acrylate terminated polyurethane oligomers, (b) optionally, one or more functional acrylate or methacrylate monomers as reactive diluents and (c) a photoinitiator which is activated by visible light in the wavelength range 400 nm to 750 nm to generate free radicals to initiate the photo polymerization reaction, said photoinitiator being selected from the group consisting of
(A) 1-hydroxy-1-cyclohexyl phenyl ketone of the formula



or

(B) (ring substituted or unsubstituted) 2-hydroxy 2,2-dimethyl acetophenone of the formula



wherein the substituents R are selected from the group consisting of hydrogen, methyl, dimethyl, isopropyl, tert-butyl, chloro, bromo and fluoro, whereby the casts produced therefrom show no tendency towards discoloration in ambient light or sunlight.

4,512,341

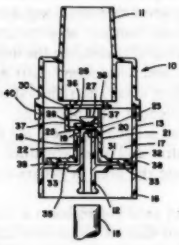
NEBULIZER WITH CAPILLARY FEED

Victor E. Lester, P.O. Box 536, Jamestown, Calif. 95237

Filed Nov. 22, 1982, Ser. No. 443,473

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.21 **4 Claims**



1. In a nebulizer having a reservoir for liquid, outlet means from said reservoir, a gas nozzle extending along the longitudinal axis of said reservoir, gas inlet means connected to said gas nozzle, a liquid spray nozzle mounted relative to said gas nozzle for nebulization of liquid sprayed from said spray nozzle, and liquid passageway means extending between said reservoir and said spray nozzle to provide a liquid flow path therebetween, wherein the improvement in said nebulizer comprises:

said reservoir including a bottom wall extending substantially normal to said longitudinal axis and formed to extend laterally across a lower side of said reservoir to a side wall;

said passageway means including a fluid-flow conduit extending from said spray nozzle and terminating in an opening positioned proximate and above said bottom wall; and

said passageway means further including a collector flange extending laterally outwardly from said conduit around said opening to substantially the greatest width dimension of said reservoir and terminating proximate said side wall with the periphery of said flange and said side wall defining an annular collector opening, said flange being mounted in spaced relation to said bottom wall at a distance not more than 0.02 inches to define a capillary passageway between said bottom wall and said flange.

4,512,342

DEVICE AND METHOD FOR REVERSIBLY OCCLUDING A BODY DUCT

Lourens J. D. Zaneveld, 900 N. Lake Shore Dr., Chicago, Ill. 60611, and James W. P. Burns, 146 S. Elgin Ave., Forest Park, Ill. 60130, assignors to Lourens J. D. Zaneveld and James W. P. Burns, both of Chicago, Ill.

Filed Apr. 14, 1982, Ser. No. 368,275

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—303 R **18 Claims**

1. A method of occluding the vas deferens, said method comprising the step of blocking the lumen of said vas deferens at a plurality of axially spaced positions by positioning at least two elongated plugs having a diameter substantially equal to the diameter of the lumen within said lumen, with said plugs being connected by a flexible connector extending through at least one aperture in the wall of the vas deferens and secured to and extending between said at least two plugs, with said flexible connector permitting movement of said plugs with respect to each other and maintaining an axial spacing between said plugs to prevent sperm passage through the vas deferens.

9. A device for reversibly occluding the vas deferens possessing peristaltic-like contractory muscle movement comprising:

two elongated plugs of cross-sectional diameter substantially equal to the inside diameter of the vas deferens and length sufficient to substantially engage the periphery of the interior of the vas deferens over a substantial distance when positioned in the lumen, and connecting means interconnecting said plugs and permitting movement of said plugs within the vas deferens due to peristaltic-like contractory muscle movement with respect to one another while maintaining an axial spacing between said plugs to prevent sperm passage through the vas deferens, said connecting means extending through the wall of the vas deferens at at least one location and being sufficiently flexible without functionally traumatizing the vas deferens such that said device, after implantation in the vas deferens, may be removed therefrom to provide a reversible male sterilization procedure.

4,512,343

MEDICAL COAGULATION DEVICE

Ernst Falk, Sternenfels-Diefenbach, and Johann Knösel, Bretten, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,379

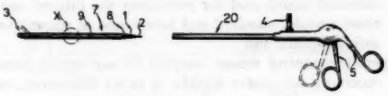
Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217165

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.17 **6 Claims**

1. A medical coagulation instrument comprising an electrically conductive hollow shaft member having proximal and distal ends and having an insulated handle affixed thereto at its proximal end and a manipulatable device operatively affixed thereto at its distal end and means for applying an electrical potential to said shaft member, an insulating jacket surrounding said shaft member for at least a portion of its length between the proximal and distal ends thereof, said insulating

jacket comprising a plurality of individual axially abutting conduit pieces surrounding said shaft member, said conduit pieces formed of insulating material, said conduit pieces being dimensioned to be slipped over said shaft member and said conduit pieces having axial end faces abutting axial end faces of



adjacent conduit pieces, the end faces of said conduit pieces abutting in such a manner as to provide a contact line of end face abutment between the inner diameter and the outer diameter of the jacket which has two radial components separated by an axial component.

4,512,344

ARTHROSCOPIC SURGERY DISSECTING APPARATUS

Forest C. Barber, P.O. Box 7744, Fort Worth, Tex. 76111

Filed May 12, 1982, Ser. No. 377,403
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—305 **11 Claims**

1. Arthroscopic sharp dissecting apparatus comprising

a rotatable dissecting tool comprising an elongated shank having an axial chuck engageable means at its proximal end and having a dissecting tip at its distal end; said chuck engageable means adapted to be engaged and rotatably driven by the chuck of a rotary motor; said dissecting tip including at least one cutting edge disposed to dissect material with which it is engaged;

a guide for said dissecting tool comprising an elongated hollow shank, means at the proximal end of said shank for attachment to said rotary motor, and protective shroud means formed at the distal end of said shank for partially enclosing said dissecting tip; said guide shank having a generally V-shaped notch formed at its distal end, opening longitudinally to said distal end at one side wall thereof, for exposing said dissecting tip to the material to be dissected;

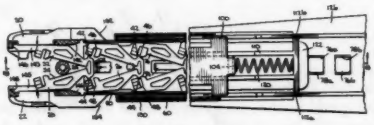
said shank including means for rotationally supporting said tool shank.

4,512,345

SURGICAL CLIP APPLYING APPARATUS, AND CLIPS AND CLIP TRAIN FOR USE THEREIN

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 30, 1982, Ser. No. 429,250
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **19 Claims**



1. Surgical clips for use in a device for applying a succession of surgical clips to body tissue, each surgical clip comprising:

a base;

two arms, each arm being connected adjacent one of its ends to a respective end of the base, and the other ends of the arms being initially free and laterally spaced from one another, the longitudinal axes of the base and arms defining the plane of the clip, each arm having an inner surface which is opposite the inner surface of the other arm and an outer surface which is opposite the inner surface of the arm;

first coupling means comprising a member unitary with the clip and projecting from the outer surface of each arm remote from the initially free end of the arm, each projecting member having a longitudinal axis which is substantially perpendicular to the longitudinal axis of the associated arm and parallel to the plane of the clip; and

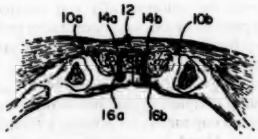
second coupling means comprising a slot in the inner surface of each arm remote from the base for removably receiving an associated one of the projecting members of an adjacent clip so that a plurality of said clips can be intercoupled in a linear array in which each clip is pulled along by the preceding clip in the array when the preceding clip moves in a direction away from the clip.

4,512,346

STERNAL CLOSURE METHOD AND MEANS

Gerald M. Lemole, 404 Tomlinson Rd., Huntingdon Valley, Pa. 19046

Filed Apr. 25, 1983, Ser. No. 488,280
Int. Cl.³ A61B *17/08, 17/04;* A61F *5/04*
U.S. Cl. 128—335 **5 Claims**



1. A device for closing a severed sternum, comprising:

a pair of rods each to be disposed longitudinally along respective separate sides of the sternum immediately adjacent to the posterior surface thereof; and

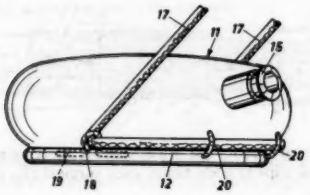
a plurality of wires each connected at one end thereof to corresponding points along each of said rods, said wires to be extended through the respective separate sides of the sternum and be connected at their other ends in opposing pairs on the anterior surface of the sternum.

4,512,347

OBSTETRIC SUCTION DEVICE

Göran O. Uddenberg, Marstrand, Sweden, assignor to AB Vacuum-Extractor, Göteborg, Sweden

Filed Dec. 23, 1982, Ser. No. 452,817
Claims priority, application Sweden, Dec. 28, 1981, 8107786
Int. Cl.³ A61B *17/42*
U.S. Cl. 128—352 **4 Claims**



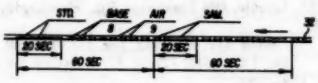
1. An obstetric suction device for vacuum extractors comprising a suction cup of a rigid material having a suction mouth, a connection piece for connecting a suction hose to said suction cup, a traction device attachable to said cup, the traction device being in the form of a two-point pulling device attachable to two attachments disposed diametrically opposite one another in close proximity to the suction mouth of the cup in such a manner that the attachments are in the form of loops which are oblique with respect to the plane of the suction mouth and the traction device is in the form of a string, ribbon or similar soft and flexible member which extends from said attachment loops around approximately half the circumference of the cup and held in this position by means of guiding means.

4,512,348

DEVICE FOR AUTOMATICALLY AND CONTINUOUSLY MEASURING THE CONSTITUENT PARTS OF BLOOD

Takatoshi Uchigaki; Akio Saito, both of Kyoto, and Naoki Yamada, Joyo, all of Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku, Japan

Filed Apr. 23, 1982, Ser. No. 371,482
Claims priority, application Japan, Apr. 24, 1981, 56-063160; Oct. 9, 1981, 56-150924[U]
Int. Cl.³ G01N *21/26*
U.S. Cl. 128—632 **6 Claims**



1. A device for automatically and continously measuring constituent parts of blood, said constituent parts being continuously drawn from the blood by means of a catheter inserted in a vein, comprising:

blood drawing means for drawing blood;

a tube pump coupled to said blood drawing means;

sample liquid cup means for holding a sample liquid received from said blood drawing means by said tube drawing pump;

standard liquid cup means for holding a standard liquid;

base liquid cup for receiving a base liquid;

sensor means for sensing said constituent part;

sensor means correction means responsive to said standard liquid and said base liquid for correcting said sensor means;

sampling means comprising a single sampling nozzle and nozzle tube for withdrawing said sample liquid, standard and base liquid from their respective cups in a predetermined order, said sampling means further comprising means for separating said withdrawn sample, standard and base liquids with air;

manifold means for receiving said separated standard liquid, base liquid and sample liquid, and for diluting them at an equal rate by the use of a buffer solution, and for interposing a layer of air between said diluted sample, base and standard liquid, and for providing the diluted and separated sample, standard and base liquid as respective measuring liquids; and

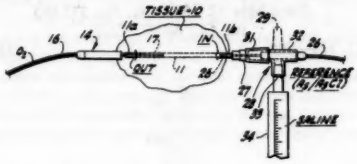
operation control means coupled to said sensor means for receiving successive signals, in order therefrom, and for correcting said sensor output signals of said sample liquid according to said standard liquid and said base liquid, and for further displaying the value of said constituent part, and further for controlling the operation of said sampling device.

4,512,349

METHOD OF DIRECT TISSUE GAS TENSION MEASUREMENT AND APPARATUS THEREFOR

Thomas K. Hunt; William H. Goodson, III; Ning Chang; David R. Knighton, all of San Francisco, Calif.; Finn Gottrup, Hojbjerg, Denmark, and Richard Firmin, London, England, assignors to Regents of the University of California, Berkeley, Calif.

Filed May 13, 1983, Ser. No. 494,173
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—632 **27 Claims**



1. A method of direct tissue gas tension measurement by use of a gas permeable tube implanted in such tissue and by gas polarography comprising the following steps:

implanting a predetermined length of said tube through said tissue and leaving a pair of exposed ends of such tube;

inserting reference and gas electrodes in respective ends of said tube;

filling said tube with an electrolytic fluid;

waiting for said gas to permeate from said tissue through said tube into said fluid;

and applying a polarographic potential between said gas and reference electrodes and measuring the electrical signal from said gas electrode.

4,512,350

TIME GAIN CONTROL SIGNAL GENERATOR FOR AN ULTRASONIC DIAGNOSTIC SYSTEM

Charles I. Cimilluca, Bronx, N.Y., assignor to Irex Corporation, Ramsey, N.J.

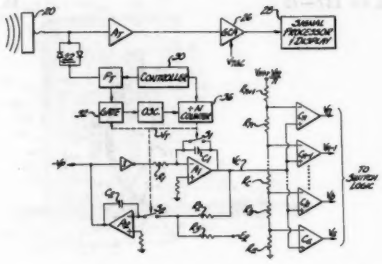
Filed Apr. 22, 1983, Ser. No. 487,788
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **12 Claims**

1. In an ultrasonic diagnostic imaging system which transmits ultrasound into the tissue of a patient and is capable of receiving ultrasonic echo information from varying tissue depths during active intervals, a time gain control circuit for controllably amplifying received ultrasonic echo information during consecutive reception periods of said active intervals comprising:

a gain controlled amplifier having an input responsive to received ultrasonic echo information signals, an output at which amplified echo information signals are produced,

and a control input responsive to a time gain control signal;

means, operated in response to the transmission of ultrasound, for producing a first signal representative of the durations of said active intervals and a second signal representative of the durations of said consecutive periods;



gain set means for selecting the gain of said amplifier during respective ones of said consecutive periods, said gain set means being responsive to said first signal for producing a plurality of gain control signals; and

means, responsive to said second signal, for applying said gain control signals to said control input of said gain controlled amplifier during said consecutive periods.

4,512,351

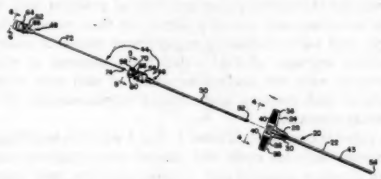
PERCUTANEOUS LEAD INTRODUCING SYSTEM AND METHOD

Peter J. Pohndorf, Miami Shores, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 19, 1982, Ser. No. 442,964

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 **20 Claims**



1. A method of introducing a flexible member in the epidural space in the spinal column of a patient, comprising the steps of:

percutaneously inserting an elongated flexible introducer having an epidural needle assembly extending through a cannula in the introducer between vertebrae in the patient's spine so that the leading tip of the epidural needle assembly and the introducer are adjacent said epidural space;

withdrawing said epidural needle assembly from the cannula of said introducer;

inserting said flexible member through the cannula of said introducer until the flexible member is positioned in said epidural space;

withdrawing said introducer from the patient while leaving said flexible member in said epidural space; and

splitting said flexible member along the elongate axis thereof following withdrawal of said introducer from the patient and removing said split introducer from around said flexible member.

4,512,352

USE OF 4-METHYL-2-HYDROXY-BENZALDEHYDE TO IMPROVE THE FLAVOR CHARACTERISTICS OF TOBACCO

Sina D. Escher, Le Lignon, and Paul Dietrich, Troinex, both of Switzerland, assignors to Firmenich SA, Switzerland

Division of Ser. No. 368,508, Apr. 15, 1982, Pat. No. 4,443,485. This application Feb. 14, 1984, Ser. No. 579,945

Claims priority, application Switzerland, May 21, 1981, 3314/81

Int. Cl.³ A24B *15/30*

U.S. Cl. 131—276 **2 Claims**

1. A method to enhance, modify or improve the sweet gustative note of caramel and burnt type reminisint of coumarin of smoking tobacco and tobacco products, which comprises the step of adding thereto between about 5 and 200 parts per million by weight based on the total weight of the flavorized smoking tobacco or tobacco product of 4-methyl-2-hydroxybenzaldehyde.

4,512,353

TOBACCO DRYING PROCEDURE

Warren A. Brackmann, Mississauga, Canada, assignor to Rothmans of Pall Mall Canada Limited, Don Mills, Canada

Filed Feb. 16, 1983, Ser. No. 466,792

Claims priority, application United Kingdom, Mar. 2, 1982, 8206083

Int. Cl.³ A24B *3/10, 3/18*

U.S. Cl. 131—304 **7 Claims**

1. In a method of drying particulate tobacco material by passing particulate tobacco material to be dried from one end of a heated drying zone to the other, heating said particulate tobacco material during its passage through the drying zone, and contacting said heated particulate tobacco material with an air stream flowing through said drying zone to remove moisture from the heated particulate tobacco material, the improvement which comprises flowing said air stream in the direction of movement of the particulate tobacco material through the entire drying zone at a rate such that the air imparts a translational motion to the particulate tobacco material in the entire drying zone and the speed of individual tobacco particles through the entire drying zone is proportional to the size of the individual tobacco particle.

4,512,354

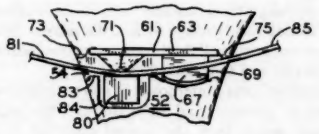
DENTAL FLOSS APPLICATOR WITH IMPROVED FLOSS SEVERING AND ANCHORING

Robert J. Loubier, 5122 Chippewa Ct., Ft. Wayne, Ind. 46804, and Robert A. Muhn, 918 Reed Rd., Ft. Wayne, Ind. 46815

Continuation-in-part of Ser. No. 435,619, Oct. 20, 1982,. This application Jul. 26, 1983, Ser. No. 517,331

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—91 **12 Claims**



1. In a dental floss applicator for use in dispensing and supporting a strand of dental floss under tension for cleaning between teeth of the type having a user actuable capstan for periodically substituting a fresh floss strand segment for a previously used segment and for maintaining strand segment tension during use of the applicator, an arrangement for contemporaneously severing floss and anchoring a floss strand end to the capstan as a result of a simple continuous movement of

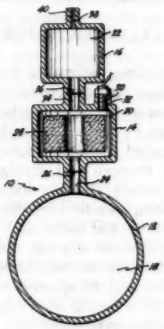
the strand by a user comprising a slot in the capstan, and a metallic floss severing and anchoring plate nested in the slot, the plate having a gently deformed dimple which in conjunction with one slot surface defines a floss receiving gap sufficiently narrow to securely grip floss pulled into the gap and a cutting edge adjacent to and protruding in the same general direction as the dimple so that as a user pulls floss into the slot, a section of floss is wedged between the dimple and one slot surface while an adjacent floss section engages and is severed by the cutting edge.

4,512,355

PROPELLANT AUGMENTED, PRESSURIZED GAS DISPENSING DEVICE

Lyle D. Galbraith, Redmond, Wash., assignor to Rocket Research Company, Redmond, Wash.

Filed Dec. 16, 1982, Ser. No. 450,355
Int. Cl.³ B60R *21/08*
U.S. Cl. 137—68 A **5 Claims**



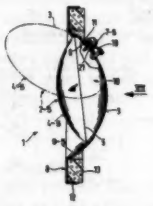
1. In a pressurized gas dispensing device including:
means defining a first chamber for holding a gas under pressure;
means defining a second chamber for holding a propellant;
means defining first flow passage means placing said first and second chambers in fluid communication, the first flow passage means comprising all fluid communication means between the first and second chambers; and
means defining second flow passage means for exhausting fluids from said second chamber, the improvement comprising:
means defining a third chamber in fluid communication with said second flow passage means, the second flow passage means comprising all fluid communication means between the second and third chambers;
pressure relief means interposed in said second flow passage means to prevent fluid flow through the second flow passage means from the second chamber to the third chamber until the pressure in said second chamber reaches a predetermined high pressure as a result of ignition of propellant in the second chamber, and to thereupon permit said fluid flow through the second flow passage means; and
means defining third flow passage means for exhausting said third chamber, said third flow passage means being smaller in total cross-section than the second flow passage means and being the sole means for exhausting said third chamber.

4,512,356

EXHAUST AIR VALVE

Lennart Widerby, Jonkoping, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Jan. 26, 1983, Ser. No. 461,039
Claims priority, application Sweden, Jan. 29, 1982, 8200487
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—75 **16 Claims**



1. A valve for a ventilation channel comprising a valve casing with a valve seat element defining a flow passage orifice for air which is to be sucked out of or forced from a space, said valve seat element becoming narrower and converging in the direction of flow through the flow passage orifice, a valve body element cooperable with the upstream surface of the valve seat element and selectively operable for opening and closing the flow passage, the confronting surfaces of the valve seat element and the valve body element engaging each other along at least a line contact surrounding said orifice when the valve is closed, and being concave and convex respectively with the same center of curvature, characterized in that the confronting surfaces of the valve seat element and the valve body element comprise surface segments having the same radius of curvature and an arcuate extension no greater than 180 degrees, the surface segment of the seat element having an orifice with a width smaller than the width of the valve body surface segment, said valve body element being selectively slidable along one of said confronting surface segments between its open and closed positions, in the open position said body element being out of registry with said orifice to open a flow passage therethrough, and in closed position said body element covering said orifice to close the flow passage therethrough, said valve including engagement means to maintain the surface segment of said valve body element in sliding engagement with the surface segment of said seat element throughout said opening and closing displacements of said valve body element.

9. A valve according to claims 1, 2 or 3 wherein said engagement means includes open and closed stop abutment means defining an open position and a closed position, said engagement means affording displacement of said body element between said positions.

10. A valve according to claim 9 wherein said engagement means includes a valve operator for displacing said body element between said positions.

12. A valve according to claim 10 wherein said valve operator comprises a spring device urging said body element toward said closed position, and a heat-sensitive member rendering said spring device inoperative when the ambient temperature is below a predetermined temperature level.

4,512,357

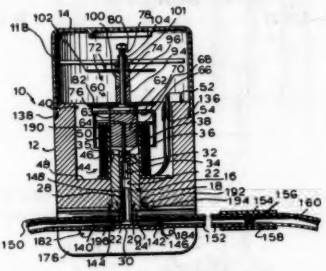
PRESSURE TRANSDUCER

Webster B. Earl, Lewisville, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Jan. 12, 1983, Ser. No. 457,461
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—82 **10 Claims**

1. An electric to pneumatic transducer comprising a housing, nozzle means for releasing air or a gas or gases located in

said housing, inlet means for transmitting air or a gas or gases to said nozzle means, magnetic means acting upon said nozzle means for varying the amount of air or a gas or gases released from said nozzle means and electrical activating means operatively associated with said means for acting upon said nozzle means for controlling said magnetic means for acting upon said



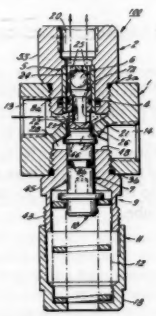
nozzle means in accordance with an electrical signal, said magnetic means for acting upon said nozzle means including means for limiting lateral movement thereof and for permitting reciprocal movement thereof comprising spring means, said spring means comprising a plurality of substantially M-shaped leaf springs.

4,512,358

COMPACT LONG-LIFE BY-PASS AND PRESSURE UNLOADER VALVE

Gregory S. Kuzma, Randolph, N.J., assignor to Wm. Steinen Mfg. Co., Parsippany, N.J.

Filed Aug. 26, 1983, Ser. No. 526,608
Int. Cl.³ G05D *16/10*
U.S. Cl. 137—116 **13 Claims**



1. A valve comprising:

a valve body for containing the flow of a fluid, the valve body having a generally cylindrical central chamber; an inlet opening to the central chamber for fluid to enter the central chamber; an outlet opening to the central chamber for fluid to exit from the central chamber for providing a flow of fluid to an output; a by-pass opening to the central chamber for fluid to exit from the central chamber; the openings being disposed such that the inlet opening is between the outlet opening and the by-pass opening; the central chamber of the valve body further having a restricted portion between the inlet opening and the by-pass opening; and

a movable valve mechanism inside the central chamber in the valve body for permitting fluid to flow from the inlet opening to the outlet opening, the movable valve mechanism comprising;

a plunger comprising a hollow portion, the hollow portion having a lateral opening for receiving fluid from the inlet opening of the valve body and having an end opening for discharging fluid to the outlet opening; the plunger further comprising a widened portion which fits against the restricted portion of the valve body for forming a by-pass valve; and

a check valve at the end opening of the hollow portion of the plunger for preventing the flow of fluid from the outlet opening to the inlet opening of the valve body;

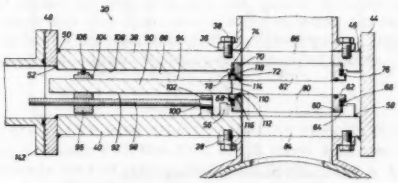
an override piston movable in relation to the plunger for driving the plunger when the output is closed for fully opening the by-pass valve and for permitting fluid to flow from the inlet opening to the by-pass opening for avoiding excessive pressure and for lowering pressure in the inlet opening to a low unloading pressure level.

4,512,359

VALVE MECHANISM WITH REPLACEABLE SEAL RINGS

Alberto L. Hinojosa; Kee Kim, both of Houston, and Kenton Chickering, III, Simonton, all of Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Apr. 13, 1984, Ser. No. 599,982
Int. Cl.³ F16K *43/00, 3/16*
U.S. Cl. 137—315 **6 Claims**



1. A gate valve mechanism permitting seal replacement while in the assembled condition thereof, comprising:

(a) a generally rectangular valve body structure formed by flat spaced side plates and flat end plates joined by welds, said valve body structure defining a valve chamber and flow passage means intersecting said valve chamber, one of said side plates forming a circular seat recess about said flow passage means, a seat retainer extending from the opposite one of said spaced side plates and forming a circular seat recess about said flow passage means;

(b) a pair of opposed seat rings being seated within said seat recesses, said seat rings each defining circular face seal groove means and passage means communicating the bottom, radially outer portion of said seal groove means with said valve chamber said face seal groove means being defined by opposed diverging frusto-conical side wall surfaces forming a restricted circular groove opening, the bottom portion of said seal groove means being formed by a pair of converging frusto-conical bottom wall surfaces intersecting respective ones of said diverging frusto-conical surfaces;

(c) resilient O-ring face seal ring means being removably retained within each of said seal groove means, said outer portion of said seal groove means being formed by tapered wall surfaces interfaces to permit easy insertion and removal of the seal ring means within said seal groove means, said resilient O-ring face seal ring means being of significantly greater cross-sectional diameter than the width of said restricted circular groove opening and being of sufficient cross-sectional dimension to simultaneously establish contact with at least one of said tapered surfaces and said diverging and converging frusto-conical surfaces to restrain any tendency of said seal mans from shifting outwardly of said seal groove means in all positions of the gate valve mechanism;

(d) nonported gate means being movably positioned with

said valve chamber and defining opposed flat sealing surfaces for sealing engagement with said seat rings, said gate means being movable between open and closed positions to control the flow of fluid through said flow passage means and being positionable radially outwardly of said resilient seal means to thus expose said resilient O-ring face seal means for removal; and

(e) means for controlling movement of said gate means within said valve chamber between said open and closed positions.

4,512,360

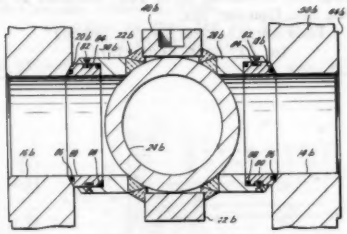
FABRICATED BALL VALVE

Clyde H. Chronister, 4 Kings Row, Houston, Tex. 77069

Filed Nov. 29, 1982, Ser. No. 445,137

Int. Cl.³ F16K *5/20*

U.S. Cl. 137—326 **1 Claim**



1. A fabricated ball valve comprising,

a housing having an inlet and outlet and a valve seat inside the housing adjacent each of the inlet and outlet,

a fabricated ball valve element positioned in the housing between the inlet and outlet and including,

a first cylindrical tubular pipe member having a sealing face on each end for seating on the valve seats and providing flow therethrough when the first tubular member is aligned between the inlet and outlet,

second and third cylindrical tubular pipe members having one end weldably connected to the outside of the first member and having a sealing face on their other ends for seating on the valve seats, said second and third members axially aligned on opposite sides of the first member and blocking flow through the valve when the second and third members are aligned between the inlet and outlet,

trunnions positioned on opposite sides of the first member perpendicular to the axis of the first member for rotating the fabricated ball,

a movable seat ring telescopically connected to the interior of each of the other ends on the second and third tubular members,

the seat rings are connected to the second and third members by a lost motion connection allowing the rings to axially move relative to the second and third members,

said seat rings include an outer resilient seal in their outer ends for seating on the valve seats, and an inner seal between the seat rings and said second and third members, respectively,

the diameter of the inner seal is greater than the diameter of the outer seal whereby the outer seals are urged away from the valve element and onto a valve seat by service pressure acting on the seat rings,

said housing including a closure flange in a plane parallel to the trunnions that can be opened for repair and replacement of the seat rings and seals.

4,512,361

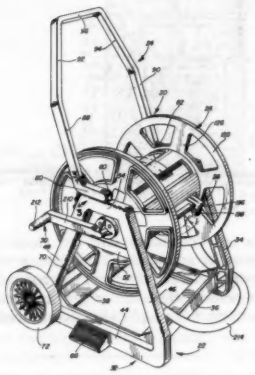
HOSE STORAGE APPARATUS

Cosmo N. Tisbo; Thomas A. Tisbo, both of Barrington; Richard D. Recker, Palatine, and Bruce Heggeland, Rolling Meadows, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Nov. 29, 1982, Ser. No. 445,100

Int. Cl.³ B65H *75/34*

U.S. Cl. 137—355.27 **26 Claims**



1. A hose storage appartus for windably storing an elongated flexible hose comprising: a frame formed of a moldable plastic material;

a reel for windably receiving an elongated flexible hose,

said reel being formed of a moldable plastic material,

said reel being rotatably mounted on the frame,

said reel including a pair of connected reel sides,

each of said reel sides including a hub rotatably mounted in the frame,

said reel including a hose support surface connecting the reel sides;

and a hose connector mounted on the reel,

said hose connector having an inlet tube rotatably mounted in the hub of one of said sides and an outlet tube having one end adapted for attachment to a hose windably mounted on the hose support surface,

said outlet tube fixed relative to the hose support surface and being connected to the inlet tube to receive a fluid delivered to the inlet tube.

4,512,362

PNEUMATIC CONTROL VALVE MANIFOLD INTERFACE

Donald L. Groeschner, New Milford, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 26, 1982, Ser. No. 444,563

Int. Cl.³ F16K *11/24*

U.S. Cl. 137—356 **10 Claims**

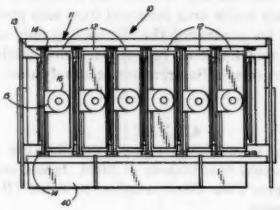
1. In a pneumatic control system for providing control functions to an associated apparatus,

a card cage having having a back plate and a plurality of card slots permanently fixed to said apparatus,

a like plurality of control logic manifolds fixed to said back plate for respective ones of said card slots,

each of said control logic manifold being individually pneumatically programmed to perform specific control functions,

a like plurality of identical control valve printed circuit board pneumatic connectors removably disposed in each



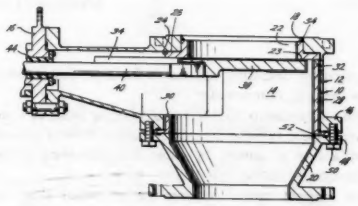
of said card slots in pneumatic communication with respective ones of said control logic manifolds.

4,512,363

SLIDE VALVE

Frank J. Jandrasi; Davy G. Pampell, and Walter J. Stinson, all of Houston, Tex., assignors to General Signal Corporation, Stamford, Conn.

Filed Aug. 25, 1982, Ser. No. 411,407
Int. Cl.³ F16L *7/00*
U.S. Cl. 137—375 **15 Claims**



1. A valve comprising, a body having an internal chamber and an inlet and outlet in fluid communication with the internal chamber for forming a flow passage through the body, a valve seat having an orifice disposed in the body about the flow passage, an abutment in the body, a tubular liner radially spaced from said orifice and disposed adjacent to the wall of said chamber and separate from the valve seat and having an abutment, said liner being removably disposed in the body, said liner abutment and said body abutment bearing against portions of said valve seat on opposite sides thereof, the valve seat being maintained in position by a clamping action of the abutments against said portions, spaced apart guides maintained in position with the valve seat, a slide valve having slides slidable in the guides operable for movement of the slide valve across the orifice into open, partially closed and closed positions, and means to move the slide valve into its positions.

4,512,364

NON-STICK GLASS STOPCOCK

Edwin Phillips, 700 Cedar Ave., P.O. Box 67, Middlesex, N.J. 08846

Filed Jan. 28, 1983, Ser. No. 462,068
Int. Cl.³ F16L *7/00*
U.S. Cl. 137—375 **8 Claims**

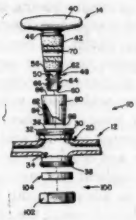
1. A valve assembly comprising:

a body portion which includes a plurality of conduits and a tapered bore intersecting each of said conduits;

a glass stem portion rotatably mounted in said body tapered bore, said stem portion having a stem body tapered to fit into said body portion tapered bore, a handle on one end of said stem portion body, a bore defined through said stem portion body, and a distal end section with said stem portion;

a tapered sleeve snugly fit about said stem portion body to be interposed between said stem portion body and said body portion tapered bore;

means for providing non-slip contact between said sleeve and said stem portion body;



adjustment means on said stem distal end portion, said adjustment means including a screw thread on said distal end portion, a lock nut threadably attached to said distal end portion and a washer interposed between said lock nut and said body portion;

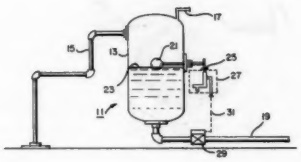
said means for providing non-slip contact between said sleeve and said stem portion body including the outer surface of the tapered body being coarse ground roughened prior to the installation of said tapered sleeve.

4,512,365

PILOT VALVE FOR AN OIL AND GAS SEPARATOR

George S. Jacobs, P.O. Box 4737, and R. David Anderson, 110 Pembroke, both of Wichita Falls, Tex. 76308

Filed Dec. 8, 1983, Ser. No. 559,325
Int. Cl.³ F16K *31/34*
U.S. Cl. 137—413 **2 Claims**



1. A float actuated pilot valve for an oil and gas separator of the type having a float responsive to the liquid level in said separator for applying a biasing force to said pilot valve, and a discharge valve associated with said separator and said pilot valve for discharging liquid from said separator when said float biases said pilot valve, the improvement comprising:

a pilot valve body having a gas inlet, a lower chamber communicating with said gas inlet, an upper chamber having a top opening, and a vertically oriented gas passage connecting said upper chamber and lower chamber;

a horizontally oriented gas outlet located in said pilot valve body between said upper and lower chambers and communicating with said gas passage;

an actuator valve contained within said upper chamber having a top stem which extends from said top opening for contact with said float, and a bottom stem slidably received within a portion of said, vertically oriented gas passage, said actuator valve having a lower sealing surface adapted to sealingly engage an opening of said vertically oriented passage into said upper chamber when said float contacts said top stem;

a control valve contained within said lower chamber having an upper stem in contact with said actuator bottom stem

and having a lower stem, said control valve having an upper sealing surface adapted to sealingly engage an opening of said vertically oriented gas passage into said lower chamber;

resilient seal means contained in said upper chamber between said actuator valve sealing surface and said gas passage and contained in said lower chamber between said control valve sealing surface and said gas passage; and

biasing means for normally biasing said control valve sealing face toward said resilient seal means to block the flow of gas from said gas outlet, the biasing force of said float on said actuator valve top stem serving to compress said upper chamber resilient seal means and to relax said lower chamber resilient seal means whereby gas is allowed to flow from said lower chamber through said vertically oriented gas passage and out said gas outlet to open said discharge valve and discharge liquid from said separator, and the upper resilient seal means being spaced from its sealing surface to allow venting between said gas outlet and the atmosphere through the upper chamber when said biasing means biases the lower resilient seal means toward its sealing surface.

4,512,366

SELF-ACTING FLUID NON-RETURN VALVE

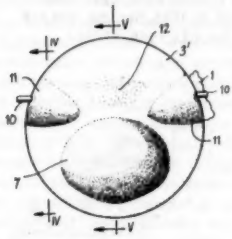
Jeffrey M. O. Lewis, Charleston, W. Va., assignor to The University Court of the University of Edinburgh, Edinburg, Scotland

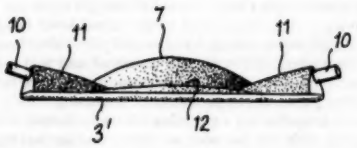
Filed Jul. 9, 1982, Ser. No. 396,686

Claims priority, application United Kingdom, Jul. 17, 1981, 8122205

Int. Cl.³ A61F *1/22*; F16K *15/03*

U.S. Cl. 137—527.8 **6 Claims**





1. In a self-acting non-return heart valve including a ring member defining a smooth bored passage, a flap member mounted in the ring member to turn by pivot means within the passage about a pivoting axis between a closed position, in which the flap member substantially closes the passage to blood flow therethrough in a first back direction, and an open position in which the flap member is substantially aligned with blood flow in a second forward direction being reverse to said first direction, the pivoting axis dividing the flap member into a minor area which is upstream, with reference to blood flow, of the pivoting axis and a major area which is downstream, with reference to blood flow, of the pivoting axis in the open position of the flap member the major area being shaped to provide an aerofoil cross-section to the flap member which generates lift in the direction to urge the flap member into the open position in the face of the second direction flow, wherein the improvement comprises said flap member being a relatively thin flap having at least one thickened localized region in said major area removed from said pivot means responsible for generating the lift, leaving only said pivot means and said localized region thickened while the remaining part of said flap remains relatively thin.

4,512,367

ROTATION DETECTING APPARATUS

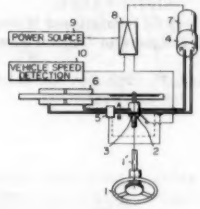
Michio Abe; Naoyuki Maeda, both of Aichi, Japan, and Robert M. Lynas, Pepper Pike, Ohio, assignors to Tokai TRW & Co. Ltd., Aichi, Japan

Filed Mar. 7, 1983, Ser. No. 472,676

Claims priority, application Japan, Mar. 15, 1982, 57-40517

Int. Cl.³ F16D *31/02*

U.S. Cl. 137—554 **5 Claims**



1. A rotation detecting apparatus for a power steering system of a vehicle, comprising:

control valve means coupled to a steering shaft of a steering wheel of the vehicle for controlling a flow of power fluid supplied to a power cylinder for powering a steering operation;

rotator magnet means secured on an input shaft of said control valve means for rotation therewith as a body;

concentric-circle shaped stator coil means adapted to face to said rotor magnet means; and

casing means functioning also as an iron core yoke mounted on a housing of said control valve for receiving said rotor magnet means and said stator coil means and supporting said stator coil means, whereby, when said input shaft is rotated in response to the steering operation of said steering wheel, an electromotive force is produced so as to detect a displacement in rotation of said input shaft.

4,512,368

FLUID DISTRIBUTOR

Motofumi Kaminaka, Wakayama; Hiroyuki Takashima, Ibaragi, and Katsuhiko Kaburagi, Wakayama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 8, 1983, Ser. No. 472,877

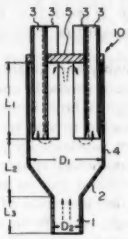
Claims priority, application Japan, Mar. 20, 1982, 57-39992[U]

Int. Cl.³ F16L *41/00*

U.S. Cl. 137—561 A **20 Claims**

1. A distributor for distributing a fluid containing solids carried on a carrier gas from a main pipe to a plurality of branch pipes, comprising a cylindrical inlet pipe portion for the introduction of fluid supplied through said main pipe, a branching portion one end of which concentrically communicates with said inlet pipe portion, a cover portion located at the other end of said branching portion, said cover portion having an inner surface and a plurality of branch pipes which extend through said cover portion for carrying a distributed fluid, the diameter of said branching portion being larger than that of

said inlet pipe portion, said plurality of branch pipes being arranged at equally spaced positions on a circle which is con-



centric with said branching portion, and each of said branch pipes extending into said branching portion.

4,512,369

EMERGENCY DISCONNECTOR FOR FLUID LOADING AND UNLOADING LINES

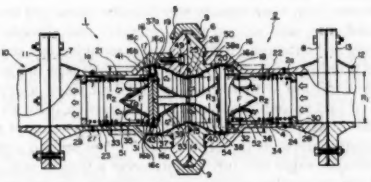
Susumu Takahashi, Niigata, Japan, assignor to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,092

Claims priority, application Japan, Feb. 26, 1982, 57-25780[U]; Apr. 13, 1982, 57-60337

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.04 **10 Claims**



1. An emergency disconnector for a fluid loading and unloading line, comprising; a pair of couplings each having a fluid passage, a pair of slide valves axially slidably movable within said couplings and being normally held apart from one another to establish a continuous fluid path through said couplings, said slide valves including valve heads, sealing means surrounding said valve heads and extending outwardly therefrom and being movable into sealing abutment with a first inner surface of said fluid passages, and a pair of cover rings covering at least a portion of said sealing means when said slide valves are positioned to provide a continuous fluid path through the couplings, said cover rings defining a portion of the fluid passages, respectively mounted on inner walls defining said fluid passages and having fluid passages therein continuous with said fluid passages of said coupling.

4,512,370

HIGH AND LOW PRESSURE SENSOR

Harry Roger, 124 Banks Ave., Lafayette, La. 70506

Continuation of Ser. No. 312,095, Oct. 16, 1981, abandoned. This application Nov. 18, 1983, Ser. No. 553,118

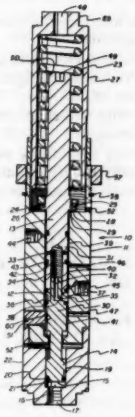
Int. Cl.³ F16K *11/07*

U.S. Cl. 137—625.66 **8 Claims**

1. A high and low pressure sensor, comprising:

(a) a cylinder housing having a piston chamber therewithin, said cylinder housing further having an inlet port for enabling the entry of a first pressurized fluid into said piston chamber, an outlet port for enabling egress of said first pressurized fluid from said piston chamber, a plurality of venting ports for enabling bleeding of any residual of said first pressurized fluid within said piston chamber, and a sensed fluid port for enabling entry of a second pressurized fluid into said piston chamber, each of said ports communicating between said piston chamber and exteriorly of said cylinder housing;

(b) a piston means sealingly and slideably mounted within said piston chamber, said piston means being shorter in length than said piston chamber so as to be capable of longitudinal movement therewithin, said piston means preventing communication between said sensed fluid port and the inlet, outlet and venting ports, said piston means further having a plurality of conduit means so constructed and arranged whereby said piston means has a first position wherein communication is enabled by a conduit between said inlet and outlet ports, and having second and third positions wherein communication is prevented between said inlet and outlet ports but is enabled between said outlet port and said venting ports, said piston further being separated into upper and lower components, said components being mutually threadedly engaged whereby the relative rotation of said components will shorten or lengthen the overall length of said piston, said upper and lower components further defining an internal passageway having a first end communicating with a groove at one end of said piston, said groove being in continuous communication with said inlet port, the internal passage-



way having a second end defined by a gap between the bottom surface of said uppermost component and a shoulder on said lower component by said outlet port is aligned with said gap, the continous flow of fluid through said inlet port and egressing through said outlet port is enabled, whereby the length of said gap is adjustable by inserting an instrument to engage a cavity formed in the upper surface of said upper component so as to enable the rotation of said upper component with respect to said lower component of said piston thereby widening or narrowing said gap, so as to enable adjustment of the desired range of said pressure sensor wherein fluid is allowed to flow therethrough; and

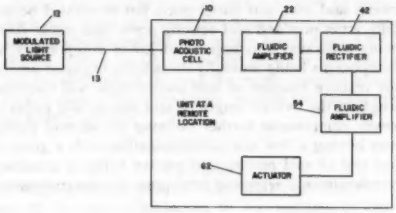
(c) resilient means mounted within said piston chamber, said resilient means urging said piston means toward said sensed fluid port, whereby the second pressurized fluid within said piston chamber urges said piston means away from said sensed fluid port so as to oppose said resilient means, whereby if said second pressurized fluid is pressurized within desired values, said piston means will assume said first position within said cylinder housing, and if said second pressurized fluid is pressurized lower than or higher than the desired value, said piston means will assume said second or third position, whereby passage of

fluid through said conduit means in said piston means and egressing through said outlet port is permitted only when said piston means is in said first position.

4,512,371
PHOTOFLUIDIC INTERFACE

Tadeusz M. Drzewiecki, Silver Spring; Kenji Toda, Rockville, and John Gurney, Kensington, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1983, Ser. No. 503,454
Int. Cl.³ F15C *1/04, 1/08, 1/12*
U.S. Cl. 137—828 **19 Claims**



1. A photofluidic interface for transducing optical signals to fluidic signals comprising:

a source of modulated electromagnetic energy that utilizes an optical carrier control signal that operates at a frequency in excess of 1000 Hz;

means for converting said electromagnetic energy to modulated fluidic signals;

means for fluidically amplifying said fluidic signals;

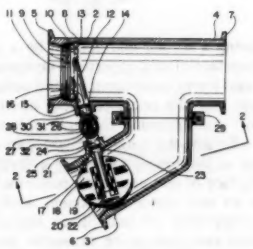
means for fluidically rectifying said fluidic signals; and

an actuator responsive to said rectified signals.

4,512,372
FLOATING DISC DIVERT VALVE

Hyok S. Lew, and Yon S. Lew, both of 7890 Oak St., Arvada, Colo. 80005

Filed Jan. 6, 1982, Ser. No. 395,834
Int. Cl.³ F16K *11/16*
U.S. Cl. 137—862 **1 Claim**



1. A floating disc divert valve comprising in combination:

(a) a parent pipe;

(b) a first pipe bifurcating from said parent pipe;

(c) a second pipe bifurcating from said parent pipe;

(d) a first annular seat included in said first pipe near one extremity having a connection means for connecting to a pipe line, said first annular seat having a seating surface substantially conforming to a spherial surface of a first hypothetical sphere of diameter slightly larger than an inside diameter of said first pipe and of center substantially coinciding with a central axis of said first pipe wherein said first annular seat is disposed intermediate said center of said first hypothetical sphere and said one extremity of said first pipe;

(e) a first disc with a rim surface substantially conforming to the spherical surface of said first hypothetical sphere rotatably disposed in said first pipe adjacent to said first annular seat;

(f) a first stem nonrotatably and slidably connected to said first disc, said first stem rotatably and slidably engaging and extending through a hole included in a first stem housing extending toward to said second pipe, a central axis of said first stem substantially passing through the center of said first hypothetical sphere wherein it substantially intersects the central axis of said first pipe in an oblique angle and further intersects a face of said first disc in another oblique angle, wherein the only possible movement of said first stem relative to said first disc is a sliding movement in a direction parallel to a face of said first disc on a plane including the central axis of said first stem;

(g) a second annular seat included in said second pipe near one extremity having a connection means for connecting to another pipe line, said second annular seat having a seating surface substantially conforming to a spherical surface of a second hypothetical sphere of diameter slightly larger than an inside diameter of said second pipe and of center substantially coinciding with a central axis of said second pipe wherein said second annular seat is disposed intermediate said center of said second hypothetical sphere and said one extremity of said second pipe;

(h) a second disc with a rim surface substantially conforming to the spherical surface of said second hypothetical sphere rotatably disposed in said second pipe adjacent to said second annular seat;

(i) a second stem nonrotatably and slidably connected to said second disc, said second stem rotatably and slidably engaging and extending through a hole included in a second stem housing extending toward to said first pipe in a coaxial relationship with respect to said first stem, a central axis of said second stem substantially passing through the center of said second hypothetical sphere wherein it substantially intersects the central axis of said second pipe in an oblique angle and further intersects a face of said second disc in another oblique angle, wherein the only possible movement of said second stem relative to said second disc is a sliding movement in a direction parallel to a face of said second disc on a plane including the central axis of said second stem;

(j) coupling means nonrotatably and slidably coupling said first and second stems to one another; and

(k) rotating means for rotating said first and second stems about the common central axis of said first and second stem, said means including means for pulling and pushing said first and second stems toward to and away from one another over a small distance; whereby, a seating pressure between said discs and said annular seats can be established for a leak-proof closure or relieved for an easy rotation of said discs.

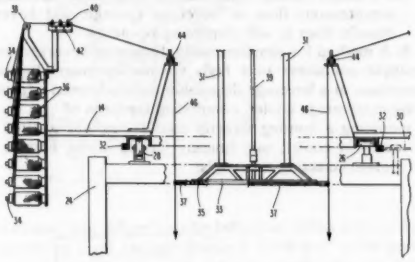
4,512,373
FEEDING AND GUIDING MEANS FOR TRIAXIAL FABRIC FORMING MACHINE

Wayne C. Trost, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed May 9, 1983, Ser. No. 492,791
Int. Cl.³ D03D *41/00, 49/16*
U.S. Cl. 139—11 **6 Claims**

1. In a triaxial fabric forming machine comprising a warp yarn supply creel mounted and adapted to rotate about an axis, and means for guiding individual warp yarn strands from said creel through a variable path length to an axially central warp yarn gathering and weaving position, said variable path length dependent on the rotation of said creel about said axis, the improvement comprising individual warp yarn supply and

tensioning means mounted on said creel, said supply means comprising a plurality of spindles, each of which is adapted to support a yarn package, and a plurality of guide means, said plurality of guide means including a plurality of individual receiving guides, each of which is adapted to receive a single yarn end in a straight path from one of said spindles, said plurality of guide means further including a circular yarn array forming means for guiding a plurality of individual yarn ends



received from said individual receiving guides into an essentially cylindrical array concentric with and parallel to the axis of said circular creel, said tensioning means comprising a means for controlling the tension separately for each yarn supplied by a yarn package located on each one of said spindles and for maintaining relatively constant tension in each yarn irrespective of the variable path length of said yarn during rotation of said creel about said axis.

4,512,374

LAMELLAE COMB FOR WEAVING APPARATUS, PARTICULARLY FOR A WEAVING ROTOR IN A MULTIPLE LONGITUDINAL TRAVERSING SHED WEAVING LOOM, AND METHOD FOR MANUFACTURING THE SAME

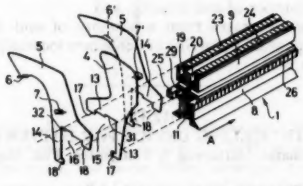
Alois Steiner, Rieden, Switzerland, assignor to Maschinenfabrik Sulzer-Rüti AG, Rüti, Switzerland

Filed Apr. 11, 1983, Ser. No. 483,527

Claims priority, application Switzerland, Apr. 20, 1982, 2377/82

Int. Cl.³ D03D *49/60, 41/00;* D03C *13/00*

U.S. Cl. 139—191 **20 Claims**



1. A lamellae comb for weaving machines, particularly for a weaving rotor of a multiple longitudinal traversing shed weaving machine, comprising:

a plurality of lamellae;

a carrier on which said lamellae are arranged;

shed-retaining elements for retaining warp threads;

each one of said shed-retaining elements comprising two lateral projections extending from two of said lamellae which enclose said shed-retaining element;

said projections including warp thread bearing surfaces lying in the same plane; and

said projections protruding towards each other, conjointly bridging an intermediate space between said two lamellae and being offset from one another in a predetermined direction of extent of the warp threads.

4,512,375

SYSTEM FOR ALTERNATELY INSERTING DIFFERENT WEFT YARNS INTO THE SHED OF A JET LOOM

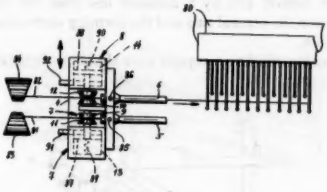
Albert H. Deborde, and Pierre Rémond, both of Bourgoin Jallieu, France, assignors to Saurer Diederichs Societe Anonyme, Bourgoin Jallieu, France

Filed Nov. 8, 1983, Ser. No. 549,929

Claims priority, application France, Nov. 9, 1982, 82 19105

Int. Cl.³ D03D *47/38*

U.S. Cl. 139—435 **18 Claims**



1. In a jet loom including shed-forming means, two insertion nozzles mounted on a mobile carrier for pneumatically introducing a respective weft yarn into a set of warp threads upon operative alignment with said shed-forming means, two thread clamps respectively associated with said insertion nozzles for temporarily retaining the corresponding weft yarns preparatorily to introduction thereof into the set of warp threads, and weft-selection means synchronized with said shed-forming means for alternatively placing said insertion nozzles in an alignment position,

the combination therewith of distributor means positively coupled with said weft-selection means for temporarily connecting a source of high-pressure air to the insertion nozzle placed in said alignment position and concurrently therewith to the associated thread clamp for releasing the weft yarn engaged thereby, said distributor means comprising two stationary gating members and a movable gating member bracketed by said stationary gating members, said stationary gating members being provided with first and second inlet ports connected to said source and with first and second pairs of outlet ports, said first pair of outlet ports being disposed on the stationary gating member opposite the gating member provided with said first inlet port, said second pair of outlet ports being disposed on the stationary gating member opposite gating member provided with said second inlet port, said first pair of outlet ports being respectively connected to said thread clamps, said second pair of outlet ports being respectively connected to said insertion nozzles, said movable member being displaceable between one working position, establishing flow paths from said first inlet port to one outlet port of said first pair and from said second inlet port to one outlet port of said second pair, and another working position, establishing flow paths from said first inlet port to the other outlet port of said first pair and from said second inlet port to the other outlet port of said second pair.

4,512,376

APPARATUS FOR FORMING STATOR COILS OF DYNAMO ELECTRIC MACHINES

Giorgio Barrera, Via Novalesa 12, Leumann (Torino), Italy

Filed Jul. 8, 1983, Ser. No. 512,054

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.1 **7 Claims**

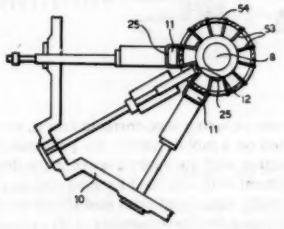
1. Apparatus for forming stator coils of the undulatory type, comprised of multi-lobed turns, for dynamo-electric machines, wherein the apparatus comprises:

a support frame having a rotatable member mounted therein,

a first circumferential series of forming elements carried by said rotatable members and located at equal distances from a central axis and equiangularly spaced from each other,

a second circumferential series of forming elements carried by said rotatable member and equiangularly located about the said central axis and intercalated between the forming elements of the first series, the forming elements of the second series being movable radially relative to the said central axis between an outer position which is spaced from the central axis by a distance greater than the distance between the central axis and the forming elements of the first series, and an inner position which is spaced from the central axis by a distance less than the distance between the central axis and the forming elements of the first series,

means for winding a copper wire about the first circumferential series of forming elements by rotation of said rotatable member so as to form a polygonal coil,



means movably carried by said support frame for moving the forming elements of the second series radially from their outer positions towards their inner positions, thrusting them against the sides of the polygonal coil so as to curve these sides towards the centre of the coil, imparting the desired undulatory multi-lobed configuration to the coil,

support means carried by said rotatable member for supporting the forming elements of the first series for free radial movement towards the central axis from the position in which they are located during the forming of the polygonal coil, under the action of the thrust exerted against the sides of the polygonal coil by the forming elements of the second series, and

means carried by said support means for opposing the said radial movement of the forming elements of the first series towards the central axis.

4,512,377

BEVERAGE DISPENSING APPARATUS

Terry N. Greer, 3237 Scruggs Park Dr., Richland Hills, Tex. 76118

Filed Dec. 19, 1983, Ser. No. 563,295

Int. Cl.³ B67D *5/02*

U.S. Cl. 141—11 **9 Claims**

1. A beverage dispensing apparatus for filling multiple containers in a high volume beverage dispensing operation, comprising:

a walk-in beverage cooler having a refrigerated interior enclosed by upright walls, a floor and a ceiling;

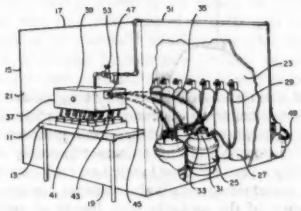
a housing mounted directly onto an upright wall of said walk-in cooler, said housing having top, bottom and interconnecting side walls, and said bottom wall being provided with beverage dispensing openings, said openings being selectively positioned for dispensing beverages into a plurality of containers located below said bottom wall, one of said housing side walls being provided with a wall duct which is aligned with an opening provided in said walk-in cooler upright wall;

a plurality of beverage transfer lines, each of said lines being connected at one end to a source of pressurized beverage inside said cooler to be dispensed, the opposite ends of said lines passing through said wall duct directly into said housing and running to said beverage dispensing openings for dispensing beverage into said containers located below said bottom wall; and

valve means located within said housing for controlling the simultaneous flow of beverage through said beverage transfer lines to said dispensing openings.

9. A method for simultaneously dispensing beverages to fill multiple containers in a high volume beverage dispensing operation, at a beverage dispensing station located adjacent a walk-in beverage cooler, comprising the steps of:

mounting a housing directly onto an upright wall of said walk-in cooler, said housing having a top, bottom and interconnecting side walls;



providing a wall duct in one of said housing side walls in alignment with a similar opening provided in said walk-in cooler upright wall;

providing beverage dispensing openings in said bottom wall of said housing, said dispensing openings being selectively positioned for dispensing beverages into a plurality of containers located below said bottom wall;

running a plurality of flexible beverage transfer lines from a source of pressurized beverage located within said walk-in cooler through said wall duct directly into said housing and to said beverage dispensing openings;

providing a valve means for each of said transfer lines within said housing for simultaneously controlling the flow of beverage through said dispensing openings;

cooling said transfer line portions located within said housing by circulating cool air from within said walk-in cooler to the interior of said housing; and

dispensing beverages from a plurality of said dispensing openings to fill a plurality of containers located below said bottom wall.

4,512,378

AUTOMATIC FILLING DEVICE FOR BATTERY CELLS

Klaus Oschmann, Mitterweg 9, Feldgeding, Fed. Rep. of Germany

PCT No. PCT/EP82/00150, § 371 Date Mar. 14, 1983, § 102(e) Date Mar. 14, 1983, PCT Pub. No. WO83/00260, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 13, 1982, Ser. No. 476,868

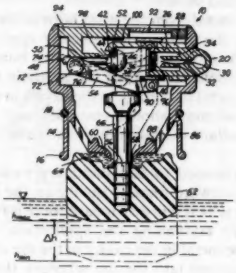
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 3127619

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—98 **20 Claims**

1. In a device for the automatic filling of battery cells with water of the type comprising a filling housing defining a filling cup to be inserted into the cell, a connection means for connection to a water supply, a valve actuated by a float for interrupting the flow of water from said water supply to said cell and a lever connecting the valve and the float, the improvement comprising said housing having an opening in the bottom

thereof; a guide rod connected at its lower end to said float and extending through said opening, said guide rod being dimensioned for a close fit with said opening for guiding the move-



ment of said float for preventing undesired tilting thereof, and an amplifying lever hingedly secured at one end to the guide rod and at the other end to the valve for transmitting the float movement to the valve body with amplified force.

4,512,379

SPOUT FOR LIQUID P/.CKING APPARATUS

Franz Hennig, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,089

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134182

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—286 **7 Claims**

1. A spout plate, for filling a container with a liquid, provided with several narrow rectangular fields of bores extending therethrough, the bores being arranged symmetrically about a central axis, the bores in a first field in the direction of discharge diverging from the bores in a second field lying opposite the first field with respect to said central axis, each bore immediately upstream of its exit orifice being reduced to a lesser diameter to form a shoulder, the bores being inclined at an acute angle to the longitudinal axis of the spout such that liquid streams emerging from the bores are aimed at an angle toward the container inner wall, the plate on its bottom having integral lips about at least part of each field and projecting into the path of streams of liquid issuing from the marginal bores of each field, whereby the marginal streams of liquid are forced to join with other liquid streams for minimized foaming during filling, the bottom of the spout plate at each field being formed into a projection which tapers downwardly to a point or edge, and which projects less far than the lip.

4,512,380

APPARATUS FOR THE TRANSVERSE AND/OR LONGITUDINAL MACHINING OF WOODEN WORKPIECES

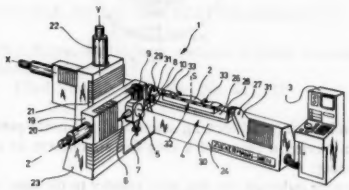
Erich Schmidt, Mauerbach, Austria, assignor to MZW Maschinenfabrik Zuckermann Pachtgesellschaft mbH, Vienna, Austria

Filed May 4, 1983, Ser. No. 491,382

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218107

Int. Cl.³ B27C *9/04*

U.S. Cl. 144—1 A **14 Claims**



1. In an apparatus having X-Y-Z coordinates for the transverse and/or longitudinal machining of wooden workpieces, comprising a workpiece carriage for mounting a workpiece or a plurality of workpieces thereon, said carriage being adapted to be displaced in the longitudinal direction of the X-axis of the apparatus and at least one transverse machining tool adapted to be displaced in the Y- and/or Z-axis of the apparatus for the machining operation, the improvement comprising a mounting table on the workpiece carriage for mounting the workpiece adapted to be tilted about an axis parallel to said X-axis.

4,512,381

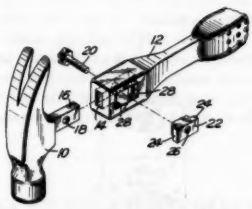
INTERCHANGABLY HEADED TOOL

Ernest Alvarez, 6040 Madison St., Ridgewood, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,833

Int. Cl.³ B25C *1/00*

U.S. Cl. 145—29 R **2 Claims**



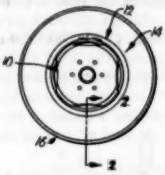
1. An interchangably headed tool comprising a handle having at one end thereof a longitudinal passage formed therein, an interchangable tool head for said handle, said head having a shank extending therefrom, said shank being insertable in said passage, a portion of the wall forming the longitudinal passage comprising a removable clamping plate adapted to abut the shank, said passage wall having posts formed therein to support said clamping plate, said clamping plate being recessed at its ends to abut the posts formed in the passage wall, said clamping plate having a threaded aperture, a clamping screw passing through the passage wall and shank to threadedly engage the clamping plate, said plate bringing clamping pressure to bear upon the shank as the screw is tightened.

4,512,382

INDEXING AND LOCKING ASSEMBLY FOR MULTI-PIECE TRUCK RIMS

Donald L. Gibson, 9 Mumford Dr., Columbia, Mo. 65201

Filed Jun. 4, 1982, Ser. No. 373,005
Int. Cl.³ B60B *25/06*
U.S. Cl. 152—408 **5 Claims**



3. An indexing and locking assembly for a multi-piece truck tire rim having a base and a ring for attachment to the base comprising:

means for indexing the ring with respect to the base, the base having a gutter, the indexing means including at least one tab extending outwardly from the gutter, the tab presenting a ramp on the normally uppermost surface thereof, the ramp being inclined from the gutter toward the center of the base;

means for locking the ring on the base, the locking means including a lug extending outwardly from the gutter, the lug being laterally spaced along said gutter from said tab, the lug presenting a ramp on the normally uppermost surface thereof, the ramp being inclined from the gutter toward the center of the base; and

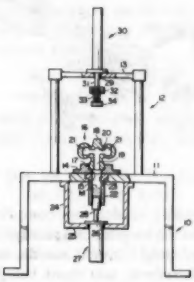
the ring having a notch therein for receiving said tab and a slot therein for receiving said lug when the ring is attached to the base.

4,512,383

DIE CASTING PROCESS AND APPARATUS THEREFOR

Shunsuke Suzuki, Tokyo; Masanobu Mori, Yokosuka, and Takeshi Miyata, Hamamatsu, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 14, 1982, Ser. No. 449,649
Claims priority, application Japan, Jan. 21, 1982, 57-6753
Int. Cl.³ B22D *18/02*
U.S. Cl. 164—35 **18 Claims**



1. A vertical pressure die casting process comprising:

preparing an air-permeable die formed with a cavity including a runner portion which is open downwardly and at least one casting cavity portion communicating with the runner portion;

melting a metal;

pouring the molten metal into a tubular sleeve fixedly held in position with respect to a stationary member and having a vertically extending axial bore;

detachably mounting said die on said stationary member so that the axial bore in the sleeve upwardly communicates with the runner portion of the cavity in the die;

clamping the die to said stationary member;

injecting the molten metal from the axial bore in the sleeve into the cavity in the die by mechanically applying an upward force to the molten metal in the axial bore in the sleeve toward the runner portion of the cavity in the die;

allowing the molten metal to solidify in the cavity in the die;

removing the die from said stationary member; and

withdrawing the resultant castings out of the cavity in the die,

wherein said die is clamped to said stationary member by application of a downward force to the die on the stationary member and in which said downward force is released from the die while continuing the application of said upward force to the metal in the cavity in the die after the molten metal is injected into the die whereby the die is forcibly removed upwardly from said stationary member.

9. A vertical pressure die casting apparatus comprising:

a stationary member;

an air-permeable die detachably mounted in its entirety on the stationary member and formed with a cavity including a vertically extending runner portion which is open downwardly and at least one casting cavity portion communicating with the runner portion;

die clamping means operative to have the die clamped vertically between said stationary member and the die clamping means;

said die being free to move upwardly away from said stationary member when disengaged from said die clamping means;

a tubular sleeve fixedly held in position with respect to said stationary member and having an axial bore upwardly communicating with said runner portion of the cavity in the die; and

a fluid-operated metal-injection power cylinder provided below said die and having a cylinder body fixedly held in position with respect to said stationary member and a piston rod extending upwardly into said sleeve and vertically slidable in the axial bore in the sleeve, said piston rod having at its upper end a cross sectional area larger than the cross sectional area which said runner portion has at its lower open end.

wherein said die clamping means comprises a fluid-operated die-clamping power cylinder provided above said die and having a cylinder body fixedly held in position with respect to said stationary member and a piston rod vertically movable toward and away from the die and a die clamping member which is located below and connected to the piston rod of the die-clamping power cylinder, said clamping member being separate from said die and being engageable with said die at the upper end of the die when the piston rod of the die-clamping power cylinder is driven to protrude downwardly from the cylinder body of the power cylinder.

4,512,384

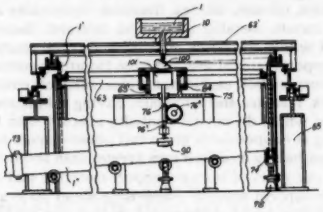
CONTINUOUS SPRAY CASTING

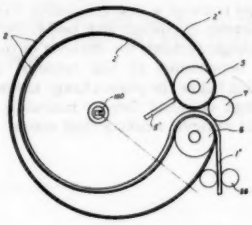
Tadeusz Sendzimir, 269 Brookside Rd., Waterbury, Conn. 06720

Filed Sep. 14, 1983, Ser. No. 532,208
Int. Cl.³ B22D *11/00*
U.S. Cl. 164—46 **9 Claims**

1. A method of continuously producing a single metallic strip product of unlimited length from molten steel comprising the steps of providing a heat absorbing target having a cylindrical target surface with a vertical axis, locating means axially of said target surface for projecting a stream of molten particles against said target surface, providing a heat absorbing upper horizontal plane above said projecting means and a heat absorbing lower horizontal plane below said projecting means,

said upper and lower planes cooperating with said target surface to form a chamber, maintaining a non-oxidizing atmosphere within said chamber, rapidly rotating and vertically oscillating said projecting means and said stream of molten particles produced thereby to deposit on said target surface a layer of metallic particles substantially only one particle deep to assure that all the particles of said layer reach a crystalizing





stage before the deposition of another layer thereon, similarly depositing subsequent layers until the product of required thickness is produced, providing said target surface with a diameter such that at least half of said particles are solid and plastic when they hit said target surface, rotating said target and said product formed thereon, and withdrawing said metallic product as a single strip.

4,512,385

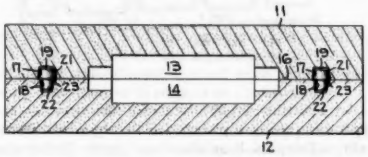
MOLD REGISTRATION APPARATUS

John J. Uppgren, St. Paul, Minn., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 337,357, Jan. 6, 1982,. This application Feb. 7, 1983, Ser. No. 464,301

Int. Cl.³ B22C *33/04*

U.S. Cl. 164—364 **6 Claims**



1. A sand mold assembly defining a mold cavity, comprising

a cope portion of the mold

a drag portion of the mold, said cope and drag portions having planar surfaces surrounding the mold cavities therein, said surfaces lying in a mold parting plane when said cope and drag are assembled to define the mold cavity,

a locating core having a first truncated cone portion and a second truncated cone portion, said first portion having a base larger than the base of said second portion, said first and second portions being joined at said bases, whereby a peripheral step is formed on said core at the junction of said first and second cone portions,

said cope and drag portions of the mold each having at least two depressions formed within the mold material and shaped to receive said first and second truncated cone portions respectively,

said cone portions having height dimensions which are less than said depression depth dimensions, so that said peripheral step rests on said drag planar surface and said cope and drag surfaces are in abutting contact in said mold parting plane.

4,512,386

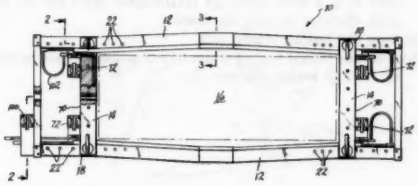
ADJUSTABLE MOLD FOR ELECTROMAGNETIC CASTING

Walter Haller, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 12, 1982, Ser. No. 441,225

Int. Cl.³ B22D *27/02, 11/10*

U.S. Cl. 164—467 **7 Claims**



1. A process for continuously casting molten metal into ingots of various sizes by electromagnetically containing and forming said molten metal comprising pouring said molten metal into a substantially rectangular shaped casting zone defined by a substantially rectangular shaped electromagnetic casting mold having side walls and end walls each having inductor portions and shield portions wherein said inductor portions induce an electromagnetic field in the casting zone so as to define the size and shape of the ingot being cast, the improvement comprising providing a gap of up to about ½" between said side walls and said end walls, adjusting the position of one of said side walls and said end walls with respect to each other so as to define the size and shape of the ingot being cast, providing electrical contact between the inductor portions of said side walls and the inductor portions of said end walls and the shield portions of said side walls and the shield portions of said end walls so as to form an inductor characterized by a closed loop and a shield characterized by a closed loop and pouring said molten metal into said casting zone while maintaining the gap between said side walls and said end walls.

4,512,387

POWER TRANSFORMER WASTE HEAT RECOVERY SYSTEM

Larry A. Rodriguez, 7452 18th St., NE., St. Petersburg, Fla. 33702; Antonio A. Padilla, 15803 Deep Creek La., Tampa, Fla. 33624, and Ned B. Spake, 2711 Summerfield Rd., Winter Park, Fla. 32792

Filed May 28, 1982, Ser. No. 383,181

Int. Cl.³ F22D *1/00, 3/00;* **F24H** *3/04*

U.S. Cl. 165—1 **5 Claims**

4. In an oil-cooled power transformer having a plurality of air-cooled radiators for cooling oil circulating through the core and coils of said transformer, the process of recovering energy losses therefrom for preheating boiler makeup water comprising the steps of:

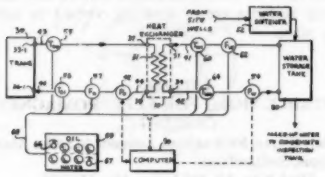
removing at least one of said air-cooled radiators;

connecting a plate heat exchanger in place of the removed radiator;

transferring hot transformer oil from the top portion of the transformer to the heat exchanger;

circulating the hot oil through an oil flow path in the plate heat exchanger;

providing water to the heat exchanger from a source of boiler makeup water;



circulating the boiler makeup water through a water flow path in the plate heat exchanger in which the water flow path is in a heat exchange relationship with the oil flow path, thereby heating the water;

storing the heated water; and

feeding the stored heated water to a condensate tank to make up for lost boiler water.

4,512,388

HIGH-TEMPERATURE DIRECT-CONTACT THERMAL ENERGY STORAGE USING PHASE-CHANGE MEDIA

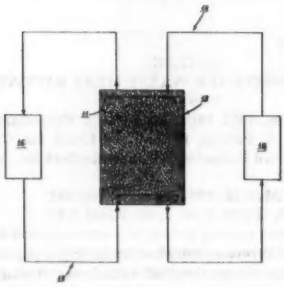
Terry D. Claar, Lisle, and Randy J. Petri, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 275,380, Jun. 19, 1981, Pat. No. 4,421,661. This application Jun. 20, 1983, Ser. No. 506,030

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.[3] **C09K** *5/06;* **F24H** *7/04;* **F28F** *23/00;* **F28D** *17/00*

U.S. Cl. 165—1 **25 Claims**



13. A process for high-temperature direct-contact thermal energy storage and retrieval comprising:

passing a storage working fluid stream in contact with a plurality of thermal energy storage elements for storage of thermal energy at about 400° to about 3000° F. comprising about 10 to about 90 volume percent solid-liquid phase-change chemical having a phase-change temperature at about 400° to about 3000° F. and selected from the group consisting of alkali metal and alkaline earth carbonates, chlorides, nitrates, nitrites, fluorides, hydroxides and sulfates, metals, metallic alloys and mixtures thereof supported within the pores of sensible thermal energy storage-support material selected from the group consisting of refractory metals, carbides, nitrides, silicides, oxides, aluminates, titanates and zirconates having submicron particle size which do not substantially coarsen with thermal cycling at temperatures up to said phase-change temperature and having a surface area greater than about 1 square meter per gram of storage-support material, said ceramic storage-support material comprising about 10 to about 90 volume percent of said thermal storage element, the inlet temperature of said storage working fluid being above the phase-change temperature of said phase-change chemical; and

when thermal retrieval is desired, passing a retrieval working fluid stream in contact with said plurality of thermal energy storage elements for retrieval of thermal energy, the inlet temperature of said retrieval working fluid stream being below the phase-change temperature of said phase-change chemical thereby increasing the temperature of said retrieval working fluid stream.

4,512,389

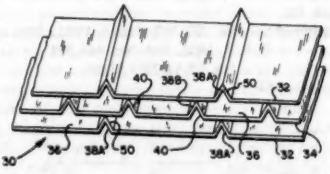
HEAT TRANSFER ELEMENT ASSEMBLY

Gary C. Goetschius, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,655

Int. Cl.[3] **F28D** *19/00*

U.S. Cl. 165—10 **2 Claims**



1. An assembly of heat transfer elements for a heat exchanger comprising: a plurality of first heat absorbent plates, a plurality of second heat absorbent plates, and a plurality of spacers, said plurality of first and second heat absorbent plates stacked alternatively in spaced relationship with said spacers interdisposed therein to maintain a predetermined spacing between adjacent plates thereby providing a plurality of passageways between first and second stacked plates for flowing a heat exchange fluid therebetween, said spacers comprising a plurality of folds in said first and second plates extending transversely across the width thereof, the folds in said first plates extending outwardly therefrom at a plurality of points spaced equally apart by a first interval and the folds in said second plates extending outwardly therefrom at a plurality of points spaced equally apart by a second interval, said first interval and said second interval being unequal to each other.

4,512,390

Patent Not Issued For This Number

4,512,391

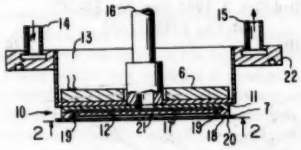
APPARATUS FOR THERMAL TREATMENT OF SEMICONDUCTOR WAFERS BY GAS CONDUCTION INCORPORATING PERIPHERAL GAS INLET

David J. Harra, Santa Cruz, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 29, 1982, Ser. No. 343,794

Int. Cl.³ F28F *7/00*; F28D *15/00*

U.S. Cl. 165—48 R **12 Claims**



1. Apparatus for the uniform temperature regulation of a substrate by gas conduction, said apparatus comprising:

a body having a substantial thermal mass which serves to provide heat transfer in respect to a substrate,

said body having wall means forming an end face,

said end face having an annular substrate-support lip projecting outwardly from said end face at a position remote from a center of said end face, whereby when a substrate is positioned against said lip, a chamber is formed by the surfaces of the end face, supporting lip and substrate,

said end face having gas conduction aperture means positioned in an annular locus located adjacent an inner rim of said lip, and said end face being solid everywhere internally of said aperture means,

said body having gas conduction passage means for conducting gas to said aperture means of said end face, whereby when a substrate is positioned against said lip, gas can be introduced into said chamber to conduct heat from one to the other of said end face and a substrate, and

means for controlling temperature of said body, said temperature controlling means being distinct from contact with said gas.

4,512,392

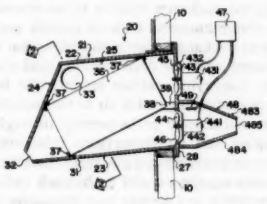
HEAT EXCHANGE APPARATUS

Dirk van Ee, P.O. Box 2693, and Larry J. Benning, P.O. Box 2006, both of Humboldt, Saskatchewan, Canada

Filed Jan. 18, 1983, Ser. No. 458,994

Int. Cl.³ F28F *3/00*

U.S. Cl. 165—54 **3 Claims**

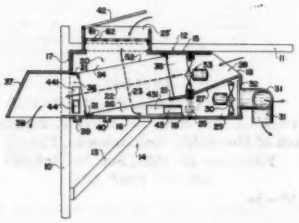


1. Heat exchange apparatus comprising an outside casing, means defining in the casing a first inlet, a first outlet, a second inlet and a second outlet, means for mounting the outside casing relative to an outside wall of a building such that the first inlet and the second outlet are arranged on one side of the wall facing within the building and the first outlet and the second inlet are arranged on the other side of the wall facing outside the building, a heat exchange block defining therethrough two separate air paths mutually at right angles, means mounting the block in the casing such that air can pass in a first and a second separate path respectively from said first inlet through said block to said first outlet and from said second inlet through said block to said second outlet, a first fan for pumping air in said first path and a second fan for pumping air in said second path, said heat exchange block comprising a plurality of thin sheets of plastics material lying in planes parallel to the first and second flows and arranged so as to divide the first and second flows into a plurality of alternate portions separated by the sheets, a plurality of elongated parallel spacer strips arranged to support and space each sheet on one side thereof relative to the adjacent sheet on that side, each spacer strip being at right angles to the sheets and extending from one edge thereof to an opposing edge, the strips being parallel to the second air path as it passes through the block and spaced by a distance of the order of the spacing between the sheet and the adjacent sheet each sheet, its respective adjacent sheet and the plurality of spacer strips being formed integrally from a plastics extrusion, and a plurality of elongated spacer members on the other side of each sheet and arranged parallel to the first air path as it passes through the block and spaced so as to support said sheet at positions including opposed edges thereof spaced widely relative to said spacing between the sheet and the next adjacent sheet, each member being formed from a strip of said plastics extrusion.

4,512,393
HEAT EXCHANGER CORE CONSTRUCTION AND AIRFLOW CONTROL

Jonathan P. Maendel, MacGregor, Canada, assignor to Baker Colony Farms Ltd., MacGregor, Canada

Filed Apr. 11, 1983, Ser. No. 483,904
Int. Cl.³ F24H *3/02*; F28F *3/00*
U.S. Cl. 165—54 **15 Claims**



1. Heat exchange apparatus comprising an enclosure, means for mounting the enclosure relative to an external wall of the building for communication with air outside and inside of the building, a heat exchange core mounted within the enclosure, means associated with the core dividing said enclosure into a first path for conveying outside air into the building and a second path or conveying inside air to the outside of the building, said first and second paths passing through said core in heat exchanging and air impervious relationship with one another, the core comprising a plurality of substantially rectangular cells defining the second path, each cell formed from sheet metal material and having two long sides and two short sides defining a slot shaped path therethrough and means for mounting the cells in parallel spaced relation such that the spaces therebetween define the first path substantially at right angles to the second path and such that one short side of each cell presents an end face against which the incoming outside air in the first path impinges, each cell being formed from a single sheet folded such that the seam completing the cell is arranged adjacent the other short side whereby said one short side and adjacent portions of the long sides are formed from unitary integral sheet metal free from seams, fan means mounted in said enclosure to move air in said paths and arranged so as to direct outside air to impinge on one face of said one short side and to direct inside air to impinge on the other face of said one short side said cell mounting means comprising a plurality of spacers arranged at the ends of the cells and set in position by a resilient settable material whereby the air in the first path contacts the outside walls of the cells and is divided from the air in the second path only by the thickness of the cell walls and casing means wrapped around the cells only at the ends thereof to bind the cells to form the core.

4,512,394
VARIABLE EFFECT ABSORPTION MACHINE AND PROCESS

Kenneth W. Kauffman, 4920 City Line Ave., Apt. #A207, Philadelphia, Pa. 19131, assignor to Kenneth W. Kauffman, Philadelphia, Pa.

Continuation-in-part of Ser. No. 207,791, Nov. 17, 1980, Pat. No. 4,442,677. This application Nov. 25, 1983, Ser. No. 554,989
Int. Cl.³ F28F *5/02*
U.S. Cl. 165—86 **15 Claims**

1. A thermal machine for producing variable effect thermal processes comprising:

an outer housing;

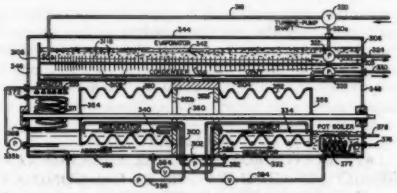
means for coupling to drive means outside the housing for producing rotational movement;

a horizontal rotatable shaft within the housing and coupled to drive means generally outside the housing;

at least one hollow cylindrical drum means within the housing fixed concentrically to the shaft to rotate with the shaft;

means associated with each such drum means to permit the collection of at least one pool of liquid within and along the inner sidewall of the drum means;

means within the outer housing to permit the collection of liquid in at least one separate pool in contact with the outer sidewall surface of each such drum means;



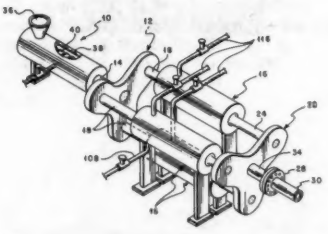
sealing means permitting rotation of each such drum means but isolating vapors within the drum means from pools within the outer housing and vapors from the other housing pools from one another; and

piping to transfer liquid from selected pools within the housing and each such drum to provide flow from pool to pool in a selected sequence.

4,512,395
MULTIPLE HEAT EXCHANGER DISTRIBUTION APPARATUS

Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Oct. 3, 1983, Ser. No. 538,077
Int. Cl.³ F28F *27/02*
U.S. Cl. 165—101 **14 Claims**



1. Apparatus for regulating the flow of thermoplastic material between a main conduit and a plurality of distribution conduits, comprising:

(a) a manifold having a main port in communication with the main conduit and a plurality of distribution ports each in communication with one of the distribution conduits, the main port in communication with the distribution ports through passageways within the manifold; and

(b) means for regulating the flow of thermoplastic material through each of the distribution ports including:

(i) a sleeve, having a flow space therethrough, axially aligned within both the distribution port and the distribution conduit for axial movement therewithin, the distribution conduit including a plurality of orifices through the surface thereof for the flow of thermoplastic material, the sleeve including a main orifice through the surface thereof for communicating the manifold passageway with the flow space of the sleeve and a plurality of flow orifices through the surface thereof for the flow of thermoplastic material, the flow of thermo-

plastic material through the distribution port regulated by communication of varying portions of the sleeve orifices with the conduit orifices by axial positioning of the sleeve; and

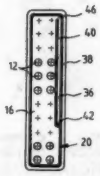
(ii) means for moving the sleeve in an axial direction.

4,512,396

WATER BOX INCLUDING A DEGASSING PASSAGE, AND A HEAT EXCHANGER INCLUDING SUCH A WATER BOX

Denis Villeval, Maurepas, France, assignor to Valeo, Paris, France

Filed Nov. 14, 1983, Ser. No. 551,569
Claims priority, application France, Nov. 18, 1982, 82 19345
Int. Cl.³ F01P *11/02, 3/20*
U.S. Cl. 165—104.32 **9 Claims**



1. In a water box for a heat exchanger suitable for use as the radiator in a cooling circuit of an internal combustion engine and which is formed from a bundle of tubes having a perforated plate at at least one end of said bundle, the perforated plate forming a transverse wall between said water box and the bundle of tubes, and the perforations of said plate forming passages between the tubes of the bundle and the water box, wherein said water box includes a passage for degassing a cooling liquid contained therein, said passage opening out near to one end of the water box and being intended for connection to an expansion chamber which is associated with the heat exchanger, the improvement comprising forming the water box of a single piece molding comprising an internal partition inside the water box which is a part of said single piece molding, and which is parallel to a longitudnal wall of the water box, the degassing passage being formed between said internal partition and said longitudinal wall, wherein said internal partition includes a free longitudinal edge which is pressed to said perforated plate in a substantially sealed manner, an opposite longitudinal edge which is connected to a wall of said water box, a transverse edge which is free and which is located near to said one end of said water box, and a transverse edge which is connected to a wall of said water box.

4,512,397

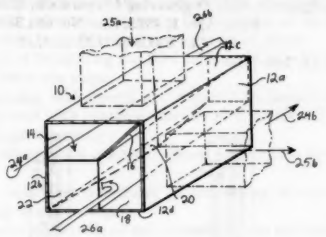
HOUSING FOR CROSS FLOW HEAT EXCHANGER

Walter Stark, 630 New York Ave., Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 382,383, May 27, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,456
Int. Cl.³ F28F *3/00*
U.S. Cl. 165—166 **7 Claims**

1. An improved cross flow heat exchanger of the type wherein two air streams are passed near one another through a heat exchanger element and the heat exchanger element keeps the two gases from coming into contact with one another but at the same time permits heat transfer from the hotter gas to the colder gas wherein the improvement comprises:

a duct type longitudinal housing having inlet and exit ends and walls for directing the two air streams longitudinally therethrough, said heat exchanger element being positioned in said longitudinal housing offset and diagonally in two planes therein, wherein the walls of the housing and



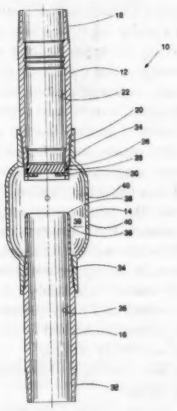
of said offset, diagonal heat exchanger element define tapered, converging inlet and diverging exit plenums.

4,512,398

PUMP-OUT PLUG CATCHER

James A. Hazel, Corsicana, Tex., assignor to Standard Oil Company, Chicago, Ill.

Filed Jul. 8, 1983, Ser. No. 512,292
Int. Cl.³ E21B *31/08*
U.S. Cl. 166—70 **8 Claims**



1. A pump-out plug catcher comprising:

a body having a first bore extending axially therethrough;

an enlarged hollow body connectable to said body and in communication with said first bore;

a pump-out plug retention means provided in said body for retaining a pump-out plug across said first bore until subjected to a predetermined fluid pressure; and

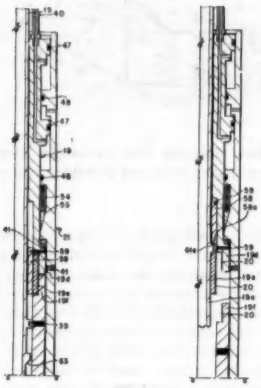
an extension member rigidly connectable to and extending into said enlarged hollow body, for retaining a released pump-out plug said extension member having a second bore extending axially therethrough and of a diameter less than said pump-out plug.

4,512,399

WELL PACKER

John C. Gano, and Donald H. Perkins, both of Carrollton, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 1, 1983, Ser. No. 481,330
Int. Cl.³ E21B *33/122, 33/126*
U.S. Cl. 166—120 14 Claims



1. A well packer comprising:

a. one or more mandrel means, each having a flow passage therethrough, and each including an upper tubular section having a connection for tubing on the upper end thereof and a shoulder thereon, connected to a second tubular section having a lower support surface thereon, connected to a third tubular section, connected to a lower tubular section having an upper sealing support surface thereon and a connection for tubing on the lower end thereof;

b. body means, releasably connected to and sealably and slidably mounted around said mandrel means, including an upper cylindrical section having a bore therethrough for each mandrel means and upper and lower external shoulders thereon, connected to a second cylindrical section, connected to a third longitudinally cut cylindrical section with threads thereon, connected to a fourth cylindrical section, connected to a lower section having a bore therethrough for each mandrel means, each bore having support surfaces at the upper and lower ends thereof;

c. outer body means releasably connected to and slidably mounted around said body means;

d. anchoring means connected to said outer body means and carried on said body means;

e. packing means carried on said body means adjoining said anchoring means;

f. hydraulic setting means responsive to fluid pressure, disposed in said body means and outer body means, for moving said outer body means downwardly on said body means, expanding said anchoring means to engage the interior wall of a well casing, and compressing and expanding said packing means into sealing engagement with said casing wall;

g. means for locking the downwardly moved outer body means to the body means thereby maintaining the packing means sealably engaging and the anchoring means engaging said casing wall; and

h. releasably connecting means in the body means for disengaging said anchoring means and said packing means from said casing wall.

4,512,400

MISCIBLE DISPLACEMENT DRIVE FOR ENHANCED OIL RECOVERY IN LOW PRESSURE RESERVOIRS

Ralph Simon, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 26, 1983, Ser. No. 545,718
Int. Cl.³ E21B *43/30, 43/40*
U.S. Cl. 166—245 6 Claims

1. A miscible drive process of recovering hydrocarbons from a low pressure hydrocarbon-bearing reservoir comprising:

injecting a C_2–C_4 mixture which forms a miscible drive fluid at reservoir conditions at a first injection well;

terminating the injection of said C_2–C_4 mixture at said first injection well and injecting natural gas at said first injection well while commencing the injection of the C_2–C_4 mixture at a second injection well separated from said first injection well by a production well;

recovering said C_2–C_4 mixture and hydrocarbons from said production well;

separating the C_2–C_4 mixture from the recovered hydrocarbons; and

reinjecting the C_2–C_4 mixture at said second injection well.

4,512,401

METHOD FOR FORMING A CEMENT ANNULUS FOR A WELL

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 344,626, Feb. 1, 1982,. This application May 27, 1982, Ser. No. 382,700
Int. Cl.³ E21B *33/14*
U.S. Cl. 166—249 7 Claims

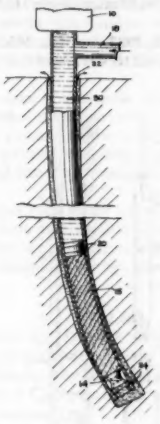
1. A method for forming a cementitious annulus around the outer wall of a well casing comprising the steps of

forcing mud, water and other foreign material out of the casing,

flowing a column of cement down the casing and out of the bottom thereof such that the cement rises up along the walls of the casing,

while the cement is being so cast, applying sonic energy to the casing by means of an orbiting mass oscillator coupled thereto, the frequency of said oscillator being adjusted to

cause elastic vibration of said casing so as to release gas bubbles, dirt and other foreign material from the casing



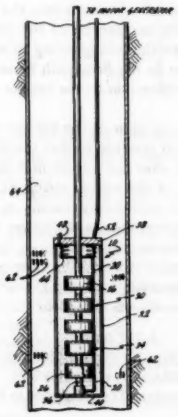
surface thereby to wet said surface with the cement to effect a sealing bond between the cement and the casing.

4,512,402

CASING TUNED DOWNHOLE TOOL

Harry W. Kompanek; James R. Ligman, both of Santa Barbara, and Eric D. Plambeck, Carpinteria, all of Calif., assignors to Sona-Tool Development Ltd., Newport Beach, Calif.

Filed May 11, 1983, Ser. No. 493,597
Int. Cl.³ E21B *43/25*
U.S. Cl. 166—249 **19 Claims**



1. In combination for facilitating the flow of oil in an oil well,

a casing disposed in the oil well and perforated to provide for a flow of oil through the casing and having a particular resonant frequency,

a tubing disposed in the casing in spaced relationship to the casing,

transducer means disposed with the tubing and cooperative with the tubing to provide a resonant frequency for the transducer means and the tubing, indpendently of the casing, corresponding substantially to the resonant frequency of the casing, and

means for energizing the transducer means at the particular resonant frequency to obtain a resonance of the casing at the particular resonant frequency through the oil in the space between the tubing and the transducer means.

13. A method of facilitating the flow of fluid in an oil well, including the following steps;

providing a casing with a particular resonant frequency in a hoop mode and with characteristics to provide for a flow of oil through the casing,

disposing a tubing in the casing in spaced relationship to the casing,

disposing at least one transducer in the tubing in spaced relationship to the tubing,

providing the combination of the transducer and the tubing with a resonant frequency in a hoop mode corresponding to the particular resonant frequency of the casing in the hoop mode and independently of the resonant frequency of the casing,

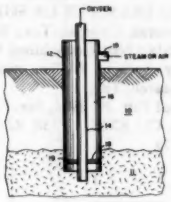
providing for a vibration of the transducer to induce a resonance of the casing, through the oil in the casing, in the hoop mode at the particular resonant frequency.

4,512,403

IN SITU COAL GASIFICATION

Joseph G. Santangelo, and John M. Fernbacher, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 174,470, Aug. 1, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,525
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—261 **8 Claims**



1. In the underground gasification of carbonaceous material in-situ through a bored injection well by the method which comprises injecting oxygen-rich gas through a conduit within said well while flowing a combustion-moderating fluid downwardly within the well in a flow path externally of said conduit, said moderating fluid being flowed at a predetermined mass flow rate sufficient to satisfy the requirements of the gasification product composition, the improvement which comprises placing a restriction in the flow path of said moderating fluid so as to restrict the cross-sectional flow area at the restriction such that at said predetermined mass flow rate the average flow velocity, defined as the volumetric flow rate at the conditions existant at the restriction divided by the total open area of the restriction, is at least equal to the critical flow velocity Vc at the restriction as given by the formula

$$V_c = gD$$

where D is the equivalent diameter of the restricted cross-sectional flow area and g is the acceleration due to gravity.

3. An injection well for underground gasification of carbonaceous solids by partial reaction with oxidizing gas in the presence of a moderating fluid, said well having an outer casing surrounding a gas injection tube within said casing for introduction of oxidizing gas into the bottom of said well, and providing a second gas flow path in said casing externally of said injection tube, adapted to be used for admission of moderating fluid to the bottom of said well; gas flow restricting means in said second gas flow path for providing a restricted

flow area within said second path, such that at a predetermined mass flow rate of the moderating fluid, the downward gas flow velocity through the restricted flow area at the restricting means corresponds to the formula

$$V_c = gD$$

wherein g is the gravity constant and D is the equivalent diameter of the the restricted flow area at the restricting means.

4,512,404

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, and Toshiyuki Ukigai, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 415,840, Sep. 8, 1982,. This application Mar. 31, 1983, Ser. No. 480,862

Claims priority, application Japan, Oct. 9, 1981, 56-160296; Mar. 11, 1982, 57-37186

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—274 **4 Claims**

1. A micellar slug for use in the recovery of oil, said slug consisting essentially of about 2% to about 90% by weight of a hydrocarbon, about 4% to about 95% by weight of an aqueous medium, about 1% to about 30% by weight of a surfactant, and about 0.1% to about 20% by weight of a cosurfactant, said surfactant containing, as an essential component, a divalent metal salt of an alpha-olefin sulfonic acid having 10 to 26 carbon atoms.

4,512,405

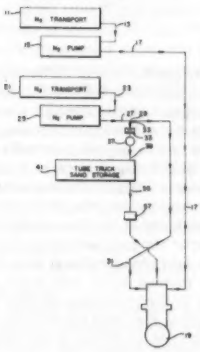
PNEUMATIC TRANSFER OF SOLIDS INTO WELLS

Ronald E. Sweatman, Cypress, Tex.; Earl R. Freeman, Oklahoma City, Okla.; John Gottschling, Williamstown, and John Simon, Ripley, both of W. Va., assignors to Hughes Tool Company, Houston, Tex.

Filed Feb. 29, 1984, Ser. No. 584,581

Int. Cl.³ E21B *33/138, 43/08, 43/267*

U.S. Cl. 166—278 **17 Claims**



1. A method of pneumatically transferring particulate solid materials into an earth formation penetrated by a well bore, comprising the steps of:

flowing a gas into the well bore to establish the desired injection rate and pressure; and

adding a particulate solid material to the established gas flow passing into the well bore by flowing a gas containing an entrained particulate solid material into the established gas flow to thereby transfer the solid particulate material pneumatically into the well bore.

4,512,406

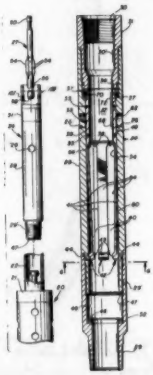
BAR ACTUATED VENT ASSEMBLY

Roy R. Vann; Flint R. George, both of Katy, Tex., and Dennis F. Warren, Albuquerque, N. Mex., assignors to GEO Vann, Inc., Houston, Tex.

Filed Jun. 7, 1982, Ser. No. 385,705

Int. Cl.³ E21B *43/116, 43/26*

U.S. Cl. 166—297 **23 Claims**



14. In a wellbore which penetrates a hydrocarbon-containing formation, the method of completing the formation comprising the steps of:

(1) suspending a subsurface perforating means and packer means from a tubing string;

(2) setting the packer means within the borehole at a position which enables the packer means to isolate a lower portion of the borehole and which positions the perforating means adjacent the formation;

(3) using the interior of the tubing string as a passageway to open a flow path which communicates the lower portion of the borehole with the interior of the tubing string by dropping a bar down the tubing string to impact a means for moving a barrier to the flow path from a closed position to an open position due to the inertia of the bar and thereafter;

(4) preventing further motion of the barrier from the open position to the closed position so that the flow path is not substantially closed after bar impact and thereafter;

(5) using the interior of the tubing string as a passageway through which the perforating means is caused to be actuated so as to communicate the lower portion of the borehole with the formation; and

(6) producing the formation along the flow path of step (3) immediately upon carrying out step (5).

4,512,407

SAND CONSOLIDATION METHODS USING ADSORBABLE CATALYSTS

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 271,426, Jun. 8, 1981, Pat. No. 4,427,069. This application Dec. 15, 1983, Ser. No. 561,970

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—295 **12 Claims**

1. A method for selectively consolidating sand grains surrounding a borehole in a relatively low temperature subterranean formation, comprising:

providing an aqueous fluid composition of a zirconium acid salt catalyst, the zirconium salt effective to cure a poly-

merizable furfuryl alcohol oligomer resin and effective to adsorb the surface of sand grains;

passing the catalyst composition through said borehole and into the formation surrounding the borehole;

allowing the acidic salt catalyst to be adsorbed onto the surface of the sand grains, said acidic salt catalyst forming a dispersed acid salt catalyst layer on the surface of the sand grains;

providing a resin composition comprising polymerizable furfuryl alcohol oligomer resin;

following the passage of the catalyst composition into the formation, passing the resin composition through said borehole and into the formation surrounding the borehole; and

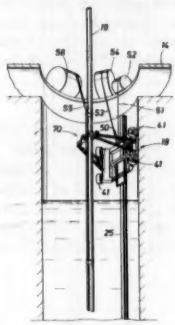
polymerizing the resin at the site of the adsorbed acidic salt catalyst to form as a reaction product a polymer effective to consolidate the sand grains without substantially reducing the permeability through the consolidated formation.

4,512,408

MOONPOOL GUIDANCE SYSTEM FOR DRILL STRINGS HAVING ATTACHED UMBILICAL LINES

Thomas R. Danielson, Morgan Hill, and Donald A. Eberwine, Fremont, both of Calif., assignors to Exxon Production Research Co., Houston, Tex.

Filed Oct. 13, 1983, Ser. No. 541,621
Int. Cl.³ E21B *15/02, 41/04*
U.S. Cl. 166—349 **8 Claims**



1. A system for guiding a continuous drill string with attached umbilical line through a moonpool of a floating structure comprising:

a means for supporting a workhead assembly within the moonpool; and

a workhead assembly adapted to engage and guide said drill string with attached umbilical line;

wherein said workhead assembly comprises:

a turntable having a central opening and adapted to be positioned about both said continuous drill string and said umbilical line;

means on said turntable adapted to allow vertical movement of said drill string and umbilical line through said turntable; and

a turntable support including means for rotatably supporting said turntable;

whereby said continuous drill string with attached umbilical line can be guided and held generally in the center of said moonpool.

7. A turntable for use in guiding a continuous drill string with attached umbilical line through a moonpool of a floating structure, comprising:

a pair of plate-like members;

means for pivotably connecting said plate-like members at one point so that when in an open position said members can be positioned about said continuous drill string and attached umbilical line, and so that when in a closed position said members define a central opening in which said continuous drill string and attached umbilical are positioned; and

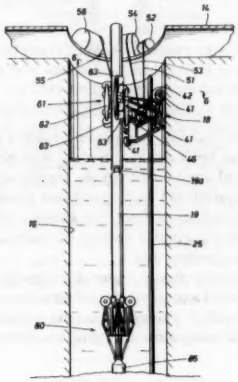
means for securing said members in said closed position; whereby said continuous drill string with attached umbilical line may be guided through and held generally in the center of said moonpool; said plate-like members being adapted to allow free longitudinal movement of said drill string through said plate-like members, and being adapted to rotate with said drill string in response to rotation of said drill string such that the angular orientation of said plate-like members to said drill string remains constant when said plate-like members are in the closed position.

4,512,409

MOONPOOL GUIDANCE SYSTEM FOR FLOATING STRUCTURES

Edward W. Gregory, Calgary, Canada; Thomas R. Danielson, Morgan Hill, and Donald A. Eberwine, Fremont, both of Calif., assignors to Exxon Production Research Co., Houston, Tex.

Filed Oct. 13, 1983, Ser. No. 541,620
Int. Cl.³ E21B *15/02, 41/04*
U.S. Cl. 166—352 **13 Claims**



1. A system for guiding drill strings or risers through a moonpool of a floating structure, said moonpool having a wall, a top, and a bottom, said system comprising:

one or more tracks on the wall of said moonpool extending vertically from the top of said moonpool to a point near the bottom thereof, wherein each said track comprises a monorail on the wall of the moonpool;

one or more guidance vehicles each movingly mounted to one of said one or more tracks; and

means for raising or lowering said vehicles along their respective tracks.

4,512,410

GEOTHERMAL EXPANSION WELLHEAD SYSTEM

Buford G. Forester, 2128 Hazlitt, Houston, Tex. 77032

Filed Sep. 16, 1983, Ser. No. 532,800
Int. Cl.³ E21B *33/03, 33/126;* **F16L** *7/00, 27/12*
U.S. Cl. 166—380 **27 Claims**

1. A geothermal wellhead system comprising

a surface casing cemented in the surface portion of a well bore and extending above the earth surface,

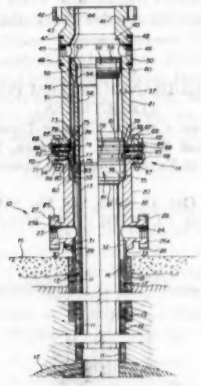
a production casing cemented in a well bore inside and extending above said surface casing,

a casing head having a tubular body portion secured on said surface casing and having an open top end with a sur-

rounding flange having at least one radially extending passageway therein,

a hollow member with an opening the same size as said casing head, with a surrounding flange secured to said casing head flange and having at least one radially extending passageway therein,

a tubular mandrel secured on said production casing and having a smooth hard cylindrical exterior surface extending through at least part of said casing head and said hollow member,



an annular seal assembly positioned adjacent to said flanges in said casing head and said hollow member,

said annular seal assembly filling the annular space surrounding said mandrel and having annular pressure activated seals positioned to contact the exterior surface of said mandrel and the interior surface of said casing head and said hollow member, and

a high temperature plastic material maintained under pressure against said annular seals and introduced through and filling said radial passageways, the outer ends of said passageways being closed by plug closures.

4,512,411

FLUID ACTUATED ENERGY CHARGED WELL SERVICE LINE CUTTER

Ronald E. Pringle, Houston, Tex., assignor to Camco Incorporated, Houston, Tex.

Filed Apr. 19, 1984, Ser. No. 601,896
Int. Cl.³ E21B *29/04*
U.S. Cl. 166—54.5 **18 Claims**

1. A fluid actuated energy charged well service line cutter for connection in a well conduit for cutting a line extending therethrough comprising,

a housing, said housing having a bore through which the line may extend, and said housing including connections for attaching the housing in a well conduit,

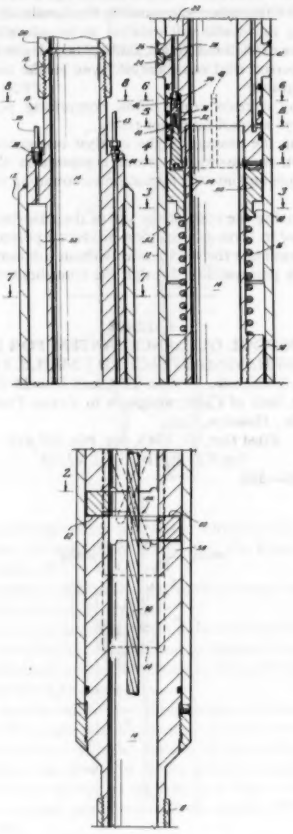
said housing including an energy chamber for holding energy,

valve means connected to the chamber for releasing energy from the chamber,

control means connected to said valve means and extending to the well surface for actuating the valve means,

piston means in the housing in communication with the energy chamber through the valve means whereby the piston is actuated when the valve means releases energy from the chamber,

cutter means in the housing normally retracted out of said bore, said cutter means connected to and moved by the piston into the bore for cutting any line in said bore, and



means for returning the piston and cutter means to a retracted position.

4,512,412

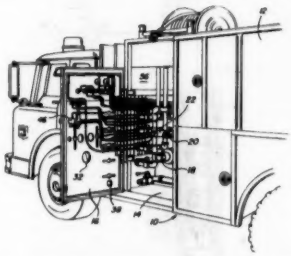
SWINGING FIRE APPARATUS PUMP OPERATOR PANEL

John W. Campbell, P.O. Box 431, Tonopah, Nev. 89049

Filed Feb. 2, 1983, Ser. No. 463,274
Int. Cl.³ A62C *27/00*
U.S. Cl. 169—24 **6 Claims**

1. A fire fighting apparatus of the type including a body defining an outwardly opening side recess comprising an operator's control station and with said recess removably closed by a control panel supporting various gauges, switches and other operating controls and having a plurality of openings formed therethrough through which water inlet and outlet couplings as well as valve controlling operators project, support means supporting said control panel from said body for movement between a closed position closing said recess with said couplings and operators projecting outwardly through said openings and an open position providing ready access to said recess for servicing and maintenance of the various control components disposed therein, said support means including an elongated support member disposed adjacent and extending along one generally straight marginal portion of said recess, mount-

ing means mounting said support means from said body for guided limited lateral outward and inward shifting relative to said body along a path which generally parallels the direction in which said recess opens outwardly, said control panel including a marginal edge portion corresponding to said one marginal portion of said recess and hingedly supported from said support member for angular displacement relative thereto about an axis generally paralleling said support member, said



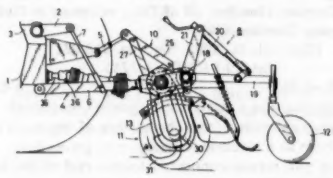
mounting means mounting said support member for lateral shifting relative to said body toward outward limit position thereof a distance sufficient to displace said panel and said openings therein fully outward of said couplings and operators to thereby allow subsequent swinging of said panel from the closed position toward the open position thereof independent of interference between said couplings and operators with the portions of said panel defining the corresponding openings.

4,512,413

ROTARY CULTIVATING APPARATUS OF LATERALLY SHIFTABLE TYPE

Mitsuki Hirata; Yoshitaka Sato, and Kaname Matudaira, all of Sakai, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Jun. 8, 1982, Ser. No. 386,319
Claims priority, application Japan, Aug. 28, 1981, 56-135738
Int. Cl.³ A01B *33/08, 33/02*
U.S. Cl. 172—74 **9 Claims**



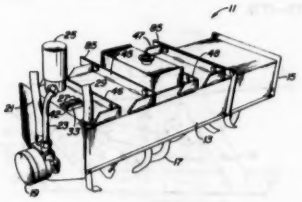
1. A rotary cultivating apparatus of the laterally shiftable type comprising an input gear case and a power input shaft, a pair of tubular support members each extending laterally from opposite sides of the input gear case, said gear case and said support members having hitch connecting portions for attachment to a vehicle a tiller frame having a rotary tiller unit and being laterally shiftably supported by the support members a transmission shaft inserted in one of the support members for transmitting power from the input shaft to the rotary tiller unit; a laterally shifting mechanism mounted in the other support member for laterally shifting the tiller frame relative to the input gear case, the shifting mechanism including a reversibly rotatable shifting screw rod screwed in an internally threaded member disposed within the other support member and fixed to the tiller frame, drive means for coupling the shifting screw rod to the transmission shaft to rotate the screw rod in a positive or reverse direction selectively and control means for operating the drive means, the drive means including a transmission gear member having an inner gear and an outer gear and a pair of intermediate gears supported by a pivotal arm and selectively meshable with the inner gear and the outer gear respectively, the control means including a lever for selectively bringing one of the intermediate gears into meshing engagement with the gear meshable therewith.

4,512,414

ROTARY TILLER

John B. Kuhn, Mayville, and Henry J. Lange, Juneau, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jan. 13, 1984, Ser. No. 570,721
Int. Cl.³ A01B *33/08;* **B60R** *27/00*
U.S. Cl. 172—112 **4 Claims**



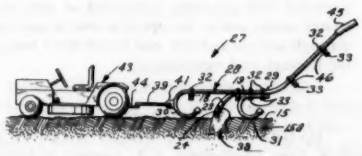
1. An improved tractor mounted rotary tiller having a housing formed by a first and second end wall, a plurality of elongated sidewalls sealably and fixably mounted at their respective ends to a respect one of said end walls, a tine shaft rotably mounted in said end walls, a top wall sealably and fixably mounted to said end and sidewalls, hydraulic drive means operatively and cooperatively mounted to said tractor and said tiller housing for driving said tine shafts wherein the improvement comprises, said tiller housing further having a bottom wall fixably mounted to said end and sidewalls beneath said top wall, whereby said walls define a fluid reservoir, an inlet tube extending through said top wall into said reservoir; a suction tube extending through said wall substantially submerged into said reservoir; means for conducting fluid to said inlet tube from said hydraulic drive means, and for conducting fluid from said suction tube to said hydraulic drive means.

4,512,415

PULL PLOW WITH PULL HANDLES AND RUNNERS AND AUTOMOBILE SELECTIVELY ATTACHED TO PLOW

William S. Jennette, 1707 Parkview Dr., Elizabeth City, N.C. 27909

Filed Apr. 16, 1984, Ser. No. 600,896
Int. Cl.³ A01B *3/02, 3/26;* **A63H** *33/30*
U.S. Cl. 172—360 **1 Claim**



1. A pull plow, comprising, in combination, a frame formed of a pair of forwardly rearwardly extending, spaced-apart, parallel side members, and a plurality of transverse cross bar members secured therebetween, a forward end of said side members being upwardly angled to form pull handles, a rearward end of said side members being arcuately downwardly curved, and forming a pair of rear runners for travel upon a ground surface, a front pair of curved runners spaced for-

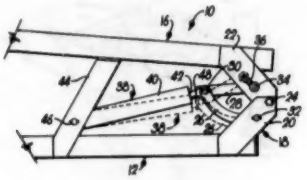
wardly of said rear runners, and being affixed to an underside of said side members; a plow member being fixedly secured on said frame, and including a plow blade affixed thereto, said plow blade being located under said frame, and being forwardly rearwardly positioned between said front and rear pairs of runners, said plow blade projecting downwardly lower than said runners; a hitch at a rear end of said frame, and a child's toy automobile selectively attachable to said hitch.

4,512,416

FLAT FOLD IMPLEMENT FRAME

David R. Smith, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Sep. 30, 1982, Ser. No. 431,008
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—776 **10 Claims**



1. In a folding implement frame:

a pair of hingedly interconnected frame sections, one of which is swingable from a generally horizontal operating position in essentially the same horizontal plane as the other section to a folded position disposed in overlying relationship to said other section;

power means connected to said other section; and

coupling means operably connecting the power means with said one section for effecting said swinging movement thereof,

said coupling means including an elongated slot and a transverse pin received therein,

said slot being so oriented relative to the line of force between the power means and the one section when the latter is in said operating position as to permit the one section to rise and fall freely and independently of the power means to the extent permitted by engagement of the pin against opposite ends of the slot,

said orientation of the slot further being such that said line of force is at least substantially perpendicular to the longitudinal axis of the slot when the one section is in a raised position approximately midway between said operating and folded positions whereby to prevent free-fall of the one section incurred by the pin moving freely in the slot,

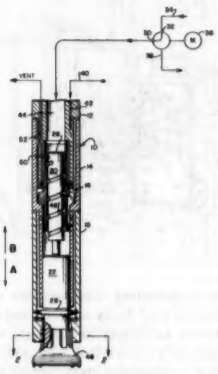
said coupling means further including an elongated, rigid, push-pull link pivotally connected at one end to said power means and at the opposite end to said one section through said pin and slot, said line of force being transmitted through said rigid link.

4,512,417

HYDRAULIC RECIPROCATING DEVICE

Ewald H. Kurt, Phillipsburg, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 318,482, Nov. 5, 1981, abandoned. This application Jan. 31, 1984, Ser. No. 575,719
Int. Cl.³ E21C *7/00*; F15B *21/02*
U.S. Cl. 173—77 **3 Claims**



1. A hydraulic reciprocating device for a downhole drill comprising:

(a) a housing;

(b) a piston means in said housing, said piston means having a first operating surface and a second opposed operating surface;

(c) a means for alternately communicating said first surface of the piston means with a hydraulic fluid; supply and hydraulic fluid return

(d) a means for continuously communicating said second surface of the piston means with pneumatic fluid wherein the piston means moves in a first impact direction when the hydraulic fluid supply communicates with the first surface of the piston and wherein the piston means moves in a second return direction when the hydraulic fluid return communicates with the first surface of the piston means; said piston having said first surface and a separate second piston having said second surface, and

(e) a means for venting said pneumatic fluid whereby said pneumatic fluid also purges the drill hole for chip removal.

4,512,418

MECHANICALLY INITIATED TUBING CONVEYED PERFORATOR SYSTEM

John A. Regalbuto, Fort Worth; James B. Patton, Arlington, and Cyril R. Sumner, Houston, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 21, 1983, Ser. No. 515,821
Int. Cl.³ E21B *43/1185*
U.S. Cl. 175—4.56 **8 Claims**

1. A tubing conveyed completion system comprising:

tubing means extending from the surface of the earth down a well bore to a location therein;

perforating gun means connected to one end of the tubing means, the perforating gun means including:

body means;

detonating cord means extending from the top of the body means through a portion thereof;

connector plug means secured to the top of the body means having one end of the detonating cord means secured therein;

hollow elongated cylindrical member means secured to the connector plug means;

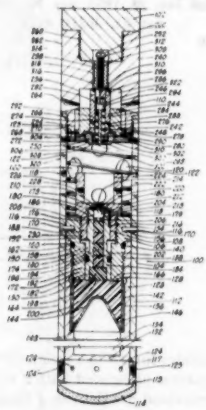
explosive means retained within the hollow elongated cylindrical member means;

tubing connector member means having one end connected to the body means and the other end connected to the tubing means, the tubing connector means including:

spring centralizer finger means disposed within the upper portion of the tubing connector member means having a portion thereof surrounding the hollow elongated cylindrical member means adapted to guide the weight actuated primary

detonating means into contact with the hollow elongated cylindrical member means; and

weight actuated primary detonating means adapted to move through the tubing means, contact the perforating



gun means, and cause the detonation of the explosive means retained within the hollow elongated cylindrical member means and the detonating cord means of the perforating gun means.

4,512,419

CORING DEVICE WITH AN IMPROVED CORE SLEEVE AND ANTI-GRIPPING COLLAR

David S. Rowley, and James T. Aumann, both of Salt Lake City, Utah, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Sep. 9, 1983, Ser. No. 530,784
Int. Cl.³ E21B *25/06*
U.S. Cl. 175—58 **18 Claims**

1. An improved coring apparatus comprising:

an outer driving structure adapted to be connected at one end to said coring bit for cutting a core in a bore hole, and at the other end to the lower end of said drill string in telescoping and co-rotatable manner therewith;

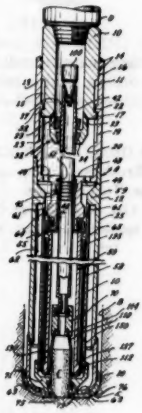
an inner barrel disposed within said outer driving structure and including a lower end portion adjacent to said bit;

means supporting said inner barrel in spaced relationship to said outer driving structure while permitting rotation of said driving structure with respect to said inner barrel;

a woven metal mesh sleeve mounted in surrounding relation on at least a portion of the exterior surface of said inner barrel, said sleeve including a leading portion adapted to be positioned within the inner barrel and initially to receive a core as it is cut,

said sleeve having a predetermined normal diameter which is greater than the diameter of the sleeve in tension and a diameter when in axial compression which is greater than said normal diameter;

the portion of said sleeve which surrounds said inner barrel being compressed axially and having an inside diameter greater than the outside diameter of said inner barrel while the portion of said sleeve positioned inside said inner barrel being in axial tension to grip and compress a core received within said sleeve and having an outside diameter in tension less than the inside diameter of said inner barrel; and



means positioned within said inner barrel and connected to the leading portion of said sleeve to draw said sleeve within said inner barrel and to apply tension to the portion of said sleeve within said barrel to encase and grip said core as it is cut.

18. A method of coring which comprises:

providing a core apparatus including a woven mesh core sleeve having a predetermined normal diameter greater than the diameter of the sleeve in tension;

lowering said coring apparatus into a borehole and driving the same to cut a core; and

maintaining a portion of said sleeve in axial compression while the remaining portion of said sleeve is in tension to grip said core as it is being cut.

4,512,420

DOWNHOLE VORTEX GENERATOR

Asadollah Hayatdavoudi, and Ladd M. Adams, both of Norman, Okla., assignors to Gill Industries, Inc., Meeker, Colo.

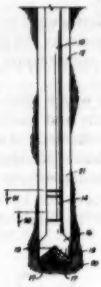
Continuation of Ser. No. 169,676, Jul. 17, 1980, Pat. No. 4,436,166. This application Jan. 24, 1984, Ser. No. 573,500
Int. Cl.³ E21B *7/18*
U.S. Cl. 175—67 **15 Claims**

1. A method of drilling a well, comprising:

rotating a drill bit attached to a lower end of a drill string by rotating an upper end of said drill string extending above a ground surface, and thereby boring a well borehole;

directing drilling fluid from within said drill string into an annulus between said drill string and said well borehole, at

an elevation above said drill bit, with a velocity component tangential to said annulus; and thereby



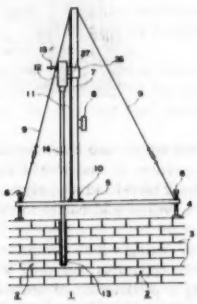
imparting a swirling motion in only one direction about said drill string to drilling fluid in said annulus.

4,512,421

METHOD FOR DRILLING COKE OVEN TOP BRICK

Fumio Ogahara, Hiroshima, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,287
Claims priority, application Japan, Oct. 5, 1982, 57-173899
Int. Cl.³ E21C *7/08*
U.S. Cl. 175—71 **4 Claims**



1. In a method wherein a vertically axially movable drill rotating shaft is rotated at each desired position on a top surface of a coke oven proper so as to rotary drill vertically a hole in a top brick at said position with a drilling bit attached to a lower end of said drill rotating shaft, the improvement comprising:

a step of vertically positioning said drill rotating shaft on a drilling position, said drill rotating shaft comprising a straight hollow shaft having therein a cooling gaseous body passage;

a first drilling step of attaching a first core bit with square chips to a lower end of said hollow shaft and rotating said hollow shaft to axially feed the same downward while forcing a cooling gaseous body into said passage through an upper part of said hollow shaft and jetting said cooling gaseous body from a forward end of said first core bit thereby drilling the top brick to a depth of at least five times of diameter of the hole to be drilled;

a second drilling step of replacing said first bit at the lower end of said hollow shaft by a second core bit with circular chips and drilling said hole drilled by said first drilling step further down to near a predetermined target depth while forcing the cooling gaseous body into said body through the upper part of said hollow shaft and jetting said cooling gaseous body from a forward end of said second core bit; and

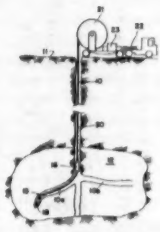
a third drilling step of replacing said second bit at the lower end of said hollow shaft with a planer type drill bit including ventilation holes and smoothly plaining a bottom of said hole drilled by said second drilling step down to said target depth while forcing the cooling gaseous body into said passage through the upper part of said hollow shaft and jetting said cooling gaseous body from a forward end of said planer type drill bit.

4,512,422

APPARATUS FOR DRILLING OIL AND GAS WELLS AND A TORQUE ARRESTOR ASSOCIATED THEREWITH

Rondel Knisley, 15611 Superior St., Sepulveda, Calif. 91343

Filed Jun. 28, 1983, Ser. No. 507,966
Int. Cl.³ E21B *4/18*
U.S. Cl. 175—99 **3 Claims**



1. A torque arrestor for use in a well hole to prevent rotation of a drilling apparatus associated with a rotating bit which is powered by pressurized gas delivered through a coiled tube, the torque arrestor comprising:

a pair of spaced side plates having first and second ends and being joined at the first and second ends to form a supporting frame;

a tube extending between the plates and being secured in non-rotating relationship therewith through which the coiled tube passes;

a first cam fixed to the supporting frame adjacent to the first ends of the plates;

a second cam slidably mounted on the frame adjacent to the second ends of the plates;

means for moving the cams toward one another;

a pair of gripping members each having at least two gripping edges, the gripping members being mounted between the plates and having first and second follower surfaces thereon aligned with the first and second cam surfaces, whereby when the cam surfaces move toward one another, the gripping members are urged laterally into engagement with the wall of the bore hole, and

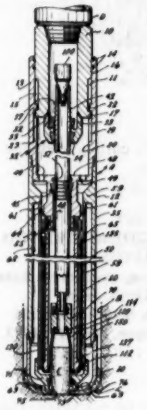
the torque arrestor wherein the gripping members are secured between the plates by links and wherein friction between the plates and gripping members is reduced by disposing bearings between the gripping members and plates and retaining the bearings in slots.

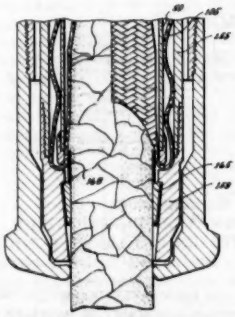
4,512,423

CORING DEVICE WITH AN IMPROVED WEIGHTED CORE SLEEVE AND ANTI-GRIPPING COLLAR

James T. Aumann, and Michael Filshtinsky, both of Salt Lake City, Utah, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Sep. 9, 1983, Ser. No. 530,783
Int. Cl.[3] E21B 25/06
U.S. Cl. 175—226 15 Claims





1. An improved coring apparatus comprising:

an outer driving structure adapted to be connected at one end to a bit for cutting a core in a bore hole, and at the other end to the lower end of a drill string in telescoping and co-rotatable manner therewith;

an inner barrel disposed within said outer driving structure and including a lower end portion adjacent to said bit;

means supporting said inner barrel in spaced relationship to said outer driving structure while permitting rotation of said driving structure with respect to said inner barrel;

a woven metal mesh sleeve mounted in surrounding relation on at least a portion of the exterior surface of said inner barrel, said sleeve having a free end and including a leading portion adapted to be positioned within the inner barrel and initially to receive a core as it is cut;

said sleeve having a predetermined normal diameter which is greater than the diameter of the sleeve in tension;

means contacting the free end of said sleeve to maintain the portion of said sleeve which surrounds said inner barrel in axial compression, and said sleeve having an inside diameter greater than the outside diameter of said inner barrel while the portion of said sleeve positioned inside said inner barrel being in tension to grip and compress a core received within said sleeve and having an outside diameter less than the inside diameter of said inner barrel when in tension;

means positioned within said inner barrel and connected to the leading portion of said sleeve to draw said sleeve within said inner barrel and to apply tension to the portion of said sleeve within said inner barrel to encase and grip a core as it is cut; and

an intermediate tube located between said inner barrel and driving structure,

core shoe means carried by one end of said intermediate barrel,

core catcher means supported by said core shoe, and

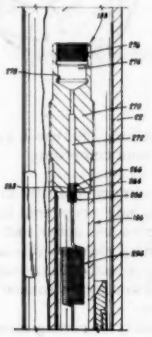
said core catcher including an extension received within the lower end of the inner barrel.

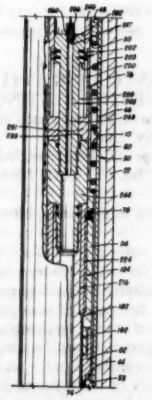
4,512,424

TUBULAR SPRING SLIP-JOINT AND JAR

Timothy R. Heemstra, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 22, 1983, Ser. No. 564,820
Int. Cl.[3] E21B 17/07
U.S. Cl. 175—299 19 Claims





1. A pressure-balanced slip joint, comprising: generally tubular housing means; coupling means at one end of said housing means and having a longitudinal bore extending therethrough;

mandrel means slidably disposed within said housing means

and having a longitudinal bore extending therethrough; and

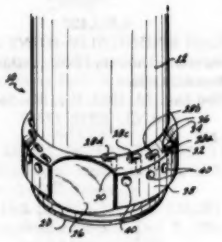
tubular spring means having a substantially constant interior volume disposed in said housing means between said coupling means and said mandrel means, one end of said tubular spring means being secured to said coupling means and the other end to said mandrel means, said coupling means bore communicating with said mandrel means bore through said tubular spring means.

4,512,425

UP-DRILL SUB FOR USE IN ROTARY DRILLING

Kenneth A. Brock, Sandy, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Feb. 22, 1983, Ser. No. 468,662
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **7 Claims**



1. A tool for earth boring for use in a drill string, adapted to drill upwardly in a bore comprising:

a body;

a multiple lobed circumferentially disposed collar radially extending from said body and including an upwardly inclined surface on said collar; and

a plurality of cutting elements disposed on said upwardly inclined surface on said collar arranged and configured to cut said bore as said tool is rotated and drawn upwardly within said bore,

wherein said plurality of cutting elements includes at least one cutting element on each lobe of said multiple lobed circumferential collar wherein said at least one element is disposed into said body and into said collar to overlap the intersection therebetween.

4,512,426

ROTATING BITS INCLUDING A PLURALITY OF TYPES OF PREFERENTIAL CUTTING ELEMENTS

Dominique A. Bidegaray, Paris, France, assignor to Christensen, Inc., Salt Lake City, Utah

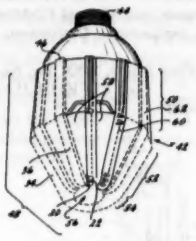
Filed Apr. 11, 1983, Ser. No. 483,896
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **23 Claims**

1. An improvement in a rotating bit having a bit face comprising:

a first plurality of cutting teeth of a first shape and composition positioned on said bit face, said cutting teeth of said first plurality adapted by said shape and composition to optimally cut a first type of material; and

a second plurality of cutting teeth included on said bit face of a second shape and composition adapted by said shape and composition to optimally cut a second type of material, said first plurality of teeth positioned on said bit face to primarily cut said first type of material and secondarily cut said second type of material, said second plurality of teeth positioned on said bit face to primarily cut said second type of material and secondarily cut said first type of material,

whereby cutting performance of said rotating bit with said first and second plurality of teeth is primarily attributable to said first or second plurality of teeth depending on



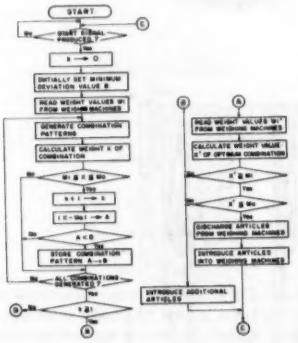
whether said rotating bit is cutting said first or second type of material respectively.

4,512,427

COMBINATORIAL WEIGHING METHOD AND APPARATUS

Kazukiyo Minamida, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Mar. 16, 1984, Ser. No. 590,356
Claims priority, application Japan, Mar. 17, 1983, 58-044811
Int. Cl.³ G01G *19/00, 19/22*
U.S. Cl. 177—1 **9 Claims**



1. A combinatorial weighing method in which weight values produced by respective ones of a plurality of weighing machines containing articles are combined, an optimum combination having a total weight equal to a target weight value or closest to the target value within set allowable limits is obtained, and the articles are discharged from those weighing machines corresponding to the optimum combination obtained, said method comprising the steps of:

(a) obtaining the optimum combination by performing combinatorial processing using weight values produced by the weighing machines at a predetermined first point in time following introduction of the articles into the weighing machines;

(b) obtaining the total weight of the obtained optimum combination again by using weight values produced by the weighing machines again at a second point in time;

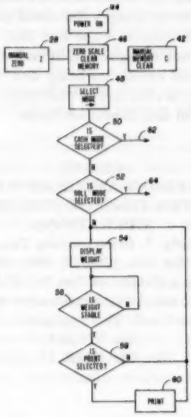
(c) determining whether the total weight value of the optimum combination, obtained the second time in said step (b), lies within the set allowable limits; and

(d) discharging the articles from those weighing machines corresponding to the optimum combination if the result of said step (c) is that the total weight value obtained the second time in said step (b), lies within the set allowable limits.

4,512,428
WEIGHING APPARATUS AND METHOD

Kenneth W. Bullivant, Scottsdale, Ariz., assignor to K-Tron International, Inc., Scottsdale, Ariz.

Filed May 5, 1983, Ser. No. 491,765
Int. Cl.³ G01G *23/22, 19/52, 19/40*
U.S. Cl. 177—25 **28 Claims**



1. A weighing apparatus for measuring a quantity of items of nominally uniform weight comprising:

means associated with the apparatus for receiving items of nominally uniform weight to be counted and for providing an output of the weight of such items;

means for detecting said weight to determine a change in a number of said items;

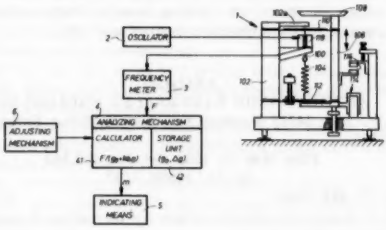
means for detecting the weight of the number of items changed and comparing that weight with a preset threshold weight; and

means for computing a count of the number of items changed for each weight less than or equal to said preset threshold.

4,512,429
WEIGHING APPARATUS FOR PRODUCING GEOGRAPHICALLY-CORRECTED MEASUREMENTS

Linus Meier, Saland, Switzerland, assignor to Mettler Instruments AG, Greifensee, Switzerland

Filed Jan. 19, 1984, Ser. No. 572,014
Claims priority, application Switzerland, Mar. 23, 1983, 1580/83
Int. Cl.³ G01G *19/22, 23/14, 3/14*
U.S. Cl. 177—25 **5 Claims**



1. In an electromechanical weighing apparatus including digital indicating means for displaying the weight of an object being weighed, the improvement which comprises means for correcting the displayed weight value in accordance with the specific force of gravity prevailing at the geographical location of the weighing apparatus, including

(a) analyzing means (4) connected between said weighing apparatus and said indicating means, said analyzing means including calculating means (41) and a storage means (42);

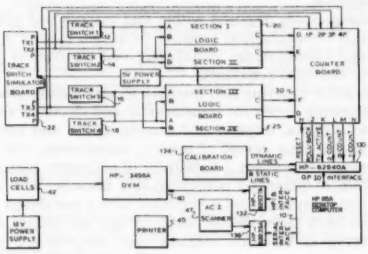
(b) electromechanical adjusting means (6) operable in a plurality of operating conditions corresponding with different predetermined gravitational acceleration values, respectively;

(c) said calculating section being operable in accordance with the selected condition of said adjusting mechanism and the information contained in said storage means to modify the weight signal (F) produced by said weighing apparatus such that said indicating means displays a corrected value which generally corresponds with the magnitude of mass (m) of the object being weighed.

4,512,430
ELECTRONIC COUPLED-IN-MOTION RAILROAD TRACK SCALE

Bruce V. Bowersox, Moorcroft, and Thomas I. Shepherd, Gillette, both of Wyo., assignors to AMAX, Inc., Greenwich, Conn.

Filed Jul. 20, 1983, Ser. No. 515,473
Int. Cl.³ G01G *19/04*
U.S. Cl. 177—163 **9 Claims**



1. An electronic coupled-in-motion railroad track scale system for determining the weight of train cars moving in either direction over a weighbridge, comprising:

(a) at least one load cell for providing an electrical signal indication of the weight of the train car on said weighbridge;

(b) a digital voltmeter for reading the electrical signal provided by at least one load cell and determining the weight of the train car on said weighbridge;

(c) four track switches for signaling the passing of a train car axle, pairs of said switches being located at each end of said weighbridge, wherein the two switches of each pair are located in close proximity to each other, one of said two switches of each pair being located on said railroad track and the other of said two switches being located on said weighbridge;

(d) logic circuitry for receiving the indications of said four track switches, wherein said logic circuitry ascertains the direction of said train and signals occurrences of two car axles on said weighbridge;

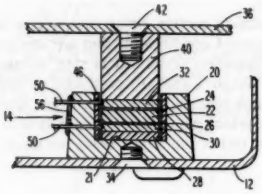
(e) A computer for receiving the signals of said logic circuitry for directing said digital voltmeter to read said load cell signal, for determining said train car weight when said logic circuitry signal indicates that two car axles are on said weighbridge and are moving in a forward direction, for reading the train car weight from said digital voltmeter and for outputting the weight of said train car; and

(f) display means for displaying the output of said computer.

4,512,431
WEIGHT SENSING APPARATUS EMPLOYING POLYMERIC PIEZOELECTRIC FILM

Philip E. Bloomfield, Bala Cynwyd, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 29, 1983, Ser. No. 527,145
Int. Cl.³ G01G 3/14
U.S. Cl. 177—210 R 8 Claims

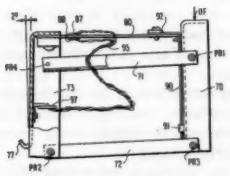


1. Weight sensing apparatus comprising
a base member, and a platform spaced thereabove for accepting weight placed thereon,
said base member having a plurality of spaced apart cavity-forming wells mounted thereto, said wells being substantially symmetrically disposed on said base member,
said platform having a plurality of members depending therefrom for mating engagement within each of said well cavities,
sensing means disposed within said cavities and adapted to receive mechanical pressure from said mating members, said sensing means transducing said mechanical pressure to electrical responses,
means for applying said pressure to said mating members,
converting means for transforming said electrical responses to a digital display, said sensing means and converting means being devoid of moving components, said sensing means comprising a transducer of polymeric piezoelectric film of polarized polyvinylidene fluoride, and wherein said polymeric film is provided with a metallized coating on both faces thereof, each of said metallized coatings being in electrical contact with ungrounded metallic members, said coated piezofilm and said ungrounded metallic members forming a piezofilm assembly, and said piezofilm assembly being surrounded and spaced from grounded metallic members.

4,512,432
WEIGHT TRANSDUCER FOR INEXPENSIVE ELECTRONIC SCALE

John W. Balenger, Rte. 4, Box 152, Leesburg, Va. 22075

Filed Dec. 15, 1982, Ser. No. 449,919
Int. Cl.³ G01G 3/14, 3/08, 21/24
U.S. Cl. 177—211 6 Claims

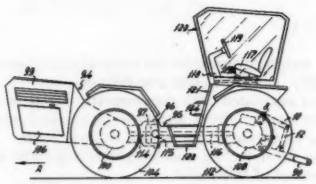


1. In an electronic scale having a cantilever beam with strain gauges bonded to the surface of said beam, stationary support means for one end of said beam, a parallelogram linkage having four rigid link members, one of which is included in said stationary support means and low friction pivot means pivotally connecting the link members proximate their ends in said parallelogram linkage, respectively, and with the free end of said cantilever beam extending proximate the pass of movement of the opposite link parallel to said stationary support means to which said cantilever beam is supported and a flexible linkage coupling the end of said beam to said opposite parallel link and electrical circuit means connected to said strain gauges for producing an electrical signal proportional to the weight of said load, the improvement comprising,
said cantilever beam being a flat metal plate having a notch formed in the center of the free end of said beam, said flexible wire link being seated in said notch and secured to one end of said cantilever beam and the end opposite to said opposite parallel link to eliminate the effect of eccentric loading on said cantilever beam.

4,512,433
ROW-CROP FRONT AND REAR WHEEL DRIVE ARTICULATED TRACTOR FOR HEAVY-DUTY OPERATIONS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 128,933, Mar. 10, 1980, Pat. No. 4,368,797, which is a division of Ser. No. 894,153, Apr. 6, 1978, Pat. No. 4,206,825, which is a continuation of Ser. No. 653,514, Jan. 29, 1976, abandoned. This application Jun. 28, 1982, Ser. No. 394,101
Int. Cl.³ B60K 17/30
U.S. Cl. 180—235 81 Claims



1. An articulated agricultural tractor which comprises:
an engine having a power rating of not less than substantially one hundred horsepower;
a frame having front and rear frame portions, a horizontal axle on each of said frame portions and at least two ground engaging wheels mounted on each said axle, each said rear wheel being aligned to follow a corresponding one of said front wheels, each said wheel being driven by said engine;
pivot means connecting said front and rear frame portions whereby said portions are pivotable relative to each other about a substantially vertical axis;
said engine mounted on said front frame portion and in a housing;
a cab containing a seat and controls for an operator mounted on said rear frame portion directly above the upper aspects of each said two rear wheels as seen both from the side and above, said engine housing being completely spaced forward from the front of said cab.

4,512,434
AERODYNAMIC BASS-REFLEX ENCLOSURE

Sin Y. Yoo, 14217 Peartree La., No. 21, Silver Spring, Md. 20906

Filed May 10, 1983, Ser. No. 493,342
Int. Cl.³ H05K 5/00
U.S. Cl. 181—146 2 Claims

1. A sound reproducing cabinet for increasing the intensity of the low-frequency range of reproduced sounds, comprising:
a. a housing having a right wall, a left wall, a front panel, a back, a top, and a bottom, all of predetermined dimensions and enclosing a predetermined volume of air mass;
b. a sound damping means of predetermined dimensions

affixed to said right wall and said left wall within said housing;

c. a first projection of vibratory sound pressures on said volume of air mass by a first speaker;

d. a second projection of vibratory sound pressures on said volume of air mass by a second speaker;

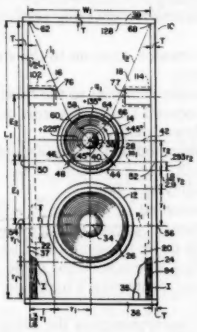
e. said first speaker mounted on the front panel of said housing at predetermined distances from said right and left walls and from the bottom of said housing and having a speaker cone of predetermined radius;

f. said second speaker having a frame extending into said housing and mounted on the front panel at a predetermined distance from said first speaker and from said right and left walls;

g. said frame having a plurality of open sectors of substantially similar dimensions spaced substantially symmetrically about said frame, at least one of said plurality of open sectors facing to the top of said housing and at least one of said plurality of open sectors facing to the bottom of said housing;

h. a damping means for reducing said second projection of vibratory sound pressures from said top- and bottom-facing open sectors of said second speaker;

i. a first sound duct having a top, a bottom, and a right side of predetermined dimensions affixed within said housing at a first opening on the front panel thereof, said first opening having substantially similar cross-sectional di-



mensions as said first sound duct and disposed at a predetermined distance from said second speaker and from the top of said housing;

j. said top and bottom of said first sound duct orthogonally affixed to said right side of said sound duct and to said left wall of said housing;

k. a second sound duct having a top, a bottom, and a left side of predetermined dimensions affixed within said housing at a second opening on the front panel thereof, said second opening having substantially similar cross-sectional dimensions as said second sound duct and disposed at a predetermined distance from said said second speaker and from the top of said housing;

l. said top and bottom of said second sound duct orthogonally affixed to said left side of said sound duct and to said right wall of said housing;

m. said predetermined volume, dimensions, and distances derived solely from the predetermined radius of said first speaker cone; and

n. the combination of said sound damping means on said walls, said sound damping means on said top- and bottom-facing open sectors, and of said first projection of vibratory sound pressures by said first speaker augmented by said second projection of vibratory sound pressures by said second speaker at said first and second sound ducts, to increase the intensity of the low-frequency range of reproduced sounds at said sound ducts and extend the range of low-frequency sounds from said ducts below the range of low-frequency sounds from said speakers.

4,512,435

DIAPHRAGM FOR LOUDSPEAKERS

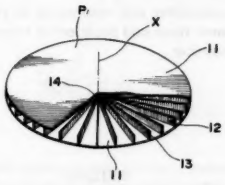
Hiroshi Takeuchi, Matsubara, and Yoshiaki Maruno, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 16, 1983, Ser. No. 475,965

Claims priority, application Japan, Mar. 16, 1982, 57-42053; Mar. 17, 1982, 57-43495; Mar. 17, 1982, 57-43496

Int. Cl.³ H04R *7/06, 7/14*

U.S. Cl. 181—170 **5 Claims**



1. A diaphragm for loudspeakers comprising in combination a pair of skin materials each being formed in disc shape approximately equal in diameter, and a core material comprised of a plurality of plate pieces joined to form a disc-shaped construction having a top face and a bottom face, said pair of skin materials being integrally constructed on said top face and said bottom face of said core material, said skin materials and core material being made both in their entirety of either boron or beryllium low in density and high in modulus of elasticity.

4,512,436

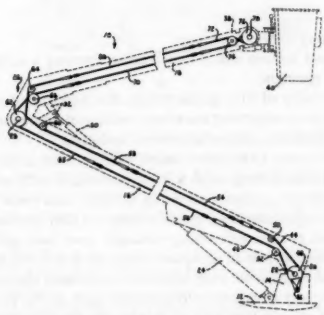
PLATFORM ROTATING MECHANISM FOR AERIAL DEVICES

Frank D. Freudenthal, Andrew County, and Carl M. Anderson, Buchanan County, both of Mo., assignors to Altec Industries, Inc., Birmingham, Ala.

Filed Jul. 1, 1983, Ser. No. 510,062

Int. Cl.³ B66F *11/04*

U.S. Cl. 182—2 **21 Claims**



1. In a vehicle mounted aerial device of the type having a boom assembly mounted for rotation on the vehicle, a generally horizontal platform pin supported on the boom assembly to turn relative thereto about an axis coinciding with the axis of the platform pin, a working platform, and leveling means for maintaining the platform pin in a substantially constant orientation relative to the ground at all positions of the boom assembly, the improvement comprising:

a mounting frame for the platform rigidly connected with

the platform pin to turn therewith about the platform pin axis;

means for mounting the platform on said frame in a manner permitting the platform to rotate relative to the frame about a generally vertical rotational axis displaced from the axis of the platform pin, said mounting means permitting the platform to rotate about said rotational axis between a first position to one side of the boom assembly and a second position beyond the end of the boom assembly;

rotation drive means for effecting rotation of the platform between the first and second positions;

stop means for stopping the platform in a preselected rotative position between the first and second positions as the platform is being rotated from the first position toward the second position; and

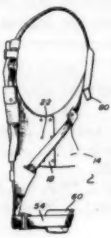
means for overriding said stop means to permit the platform to be rotated from said preselected rotative position to the second position.

4,512,437

SAFETY VEST

Garry Savage, Montreal, Canada, assignor to Institut de Recherche en Sante et en Securite du Travail du Quebec, Quebec, Canada

Filed Jun. 13, 1983, Ser. No. 503,777
Claims priority, application Canada, May 6, 1983, 427637
Int. Cl.³ A62B *35/00*
U.S. Cl. 182—3 **9 Claims**



1. A safety vest comprising:

(a) a front section and a rear section forming a torso encircling garment;

(b) a plurality of strap guide means attached to said garment;

(c) a strap arrangement associated with said guide means and said garment, said arrangement including

(i) a first pair of separate straps, each forming a continuous detachable loop with a front portion, a back portion, a shoulder portion and a hip portion, and each passing through associated guide means on said garment; said front portion extending vertically over said garment;

(ii) a second pair of separate straps, each forming a continuous detachable loop adapted to surround the thigh of a user and engaging a lower-most part of the front portion of said first pair of straps; the engagement of the second pair of straps to the lower-most part of the first pair of straps being at its front-most portions so that, at impact following an accidental fall, a major portion of the forces exerted on the strap arrangement are transmitted to the second pair of straps which cause the thighs to pivot and to provoke a dynamic resistance by the thigh muscles; and

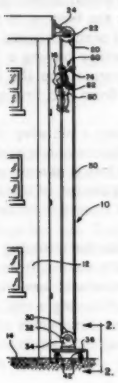
(d) buckle means associated with each strap of each pair for detaching said loops.

4,512,438

ESCAPE APPARATUS

Andrew Vilchek, deceased, late of Palos Park, Ill., and by Mary F. Trindl, executrix, 12612 Pawnee Rd., Palos Park, Ill. 60464

Filed Jan. 30, 1984, Ser. No. 574,913
Int. Cl.³ A62B *1/12*
U.S. Cl. 182—43 **11 Claims**



1. An escape apparatus for lowering persons down a structure comprising:

a base pivotably mounted adjacent to the structure to pivot in a vertical plane;

a lower pulley rotably mounted to the base;

an upper pulley secured to the structure in vertical alignment with the lower pulley;

an endless loop cable mounted to pass around the upper and lower pulley such that movement of the cable causes at least the first pulley to rotate;

adjusting means mounted to the base to adjust the vertical position of the base in opposition to tension of the cable on the first pulley in order to adjust the tension of the cable;

means for supporting a person on the cable;

a hydraulic reservoir containing a hydraulic fluid;

a hydraulic pump;

conduit means for interconnecting the pump and the reservoir such that the pump removes hydraulic fluid from the reservoir and returns the fluid under pressure to the reservoir;

restricting means for restricting the flow of hydraulic fluid in the conduit means from the pump to the reservoir;

means for coupling the pump to the first pulley such that movement of the cable causes the first pulley to rotate and the pump to force fluid through the restricting means, and the flow restriction of hydraulic fluid pumped by the pump limits the speed of the pump and thereby the speed of the cable; and

auxillary brake means coupled to the first pulley for slowing rotation of the first pulley by an additional amount when a person supported on the cable by the support means approaches the first pulley.

4,512,439

CONTROL MECHANISM FOR AERIAL LADDERS

Donald J. Howell, Franklin County, Kans., assignor to Sponco Mfg., Inc., Ottawa, Kans.

Filed Sep. 6, 1983, Ser. No. 529,215
Int. Cl.³ E06C *5/04*
U.S. Cl. 182—66 **11 Claims**

1. In a multiple section aerial ladder having a lower ladder section supported for rotation about a generally vertical rotational axis and for up and down pivotal movement about a generally horizontal pivot axis, a middle ladder section sup-

ported for extension and retraction on the lower section, and an upper ladder section supported for extension and retraction on the middle section, a control arrangement comprising:

an upper set of parallel rods mounted for rotation on the upper ladder section;

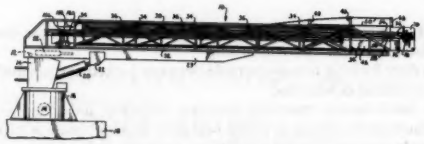
an upper set of hand levers coupled with the respective rods in a manner to rotate each rod in opposite directions from a neutral position when the corresponding lever is displaced in opposite directions from a neutral position;

a first set of parallel tubes mounted for rotation on the middle ladder section and receiving the respective rods in a manner to effect rotation of each tube when the corresponding rod is rotated, said rods being extensible out of and retractable into the tubes to accommodate extension and retraction of the upper ladder section;

a second set of parallel tubes mounted for rotation on the middle ladder section, each tube in said second set having a corresponding tube in said first set, the tubes in said first and second sets being substantially parallel and located generally side by side;

means for coupling the corresponding tubes together in pairs in a manner to rotate each tube in said second set when the corresponding tube in the first set is rotated;

a lower set of parallel rods mounted for rotation on the lower ladder section and received in the respective tubes in said second set in a manner to rotate each rod in the



lower set when the corresponding tube in said second set is rotated, said rods in the lower set being extensible out of and retractable into the tubes in said second set to accommodate extension and retraction of the middle ladder section;

a lower set of hand levers including an elevation control lever, a rotation control lever and an extension control lever to which the respective rods in said lower set are coupled in a manner to displace each lever in said lower set in opposite directions from a neutral position when the corresponding rod is rotated in opposite directions from a neutral position thereof, said levers in the lower set being accessible for manual displacement from the neutral position;

means for pivoting the lower ladder section up and down about said pivot axis when the elevation control lever is displaced in opposite directions from the neutral position;

means for rotating the lower ladder section in opposite directions about said rotational axis when the rotation control lever is displaced in opposite directions from the neutral position; and

means for extending and retracting the middle and upper ladder sections when the extension control lever is displaced in opposite directions from the neutral position,

whereby the elevation, rotation and extension of the ladder can be controlled by the upper or lower set of hand levers.

4,512,440

RUNGLESS MOTORIZED LADDER

Lawrence B. Bixby, Rte. 2, Box 1671, Oklawaha, Fla. 32679

Filed Dec. 12, 1983, Ser. No. 560,562

Int. Cl.[3] **E06C** *1/00;* **A63B** *27/04*

U.S. Cl. 182—146 **7 Claims**

1. A rungless motorized ladder apparatus comprising:

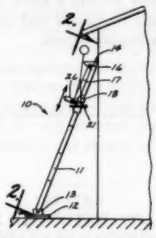
an elongated pole;

a carriage means disposed on said pole for movement up or down along said pole;

foot receiving means attached to said carriage means for permitting a person to stand thereon and move up or down with the movement of said carriage means;

a winch means operably attached to said carriage means, said winch means including a spool having a cable attached thereto at one end thereof for permitting such cable to be wound thereon;

means for attaching the other end of said cable to the top of said pole;



electric motorized means on said carriage means for rotating said spool for selectively pulling said carriage up or permitting said carriage to move downwardly; and

foot pedal switch means attached to said foot receiving means for causing said spool to turn in one rotary direction when one side of said foot pedal switch means is pushed or to turn said spool in the other rotary direction when the other side of said switch means is pushed.

4,512,441

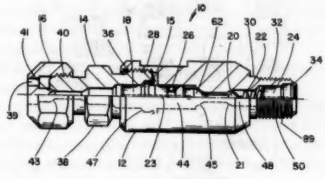
BLOWDOWN FITTING

Jack M. Cooper, Houston, Tex., assignor to General Screw Products Company, Houston, Tex.

Continuation-in-part of Ser. No. 124,444, Feb. 25, 1980, Pat. No. 4,347,915. This application Jun. 28, 1982, Ser. No. 392,753

Int. Cl.[3] **F01M** *1/18;* **F16N** *21/06*

U.S. Cl. 184—105 B **20 Claims**



1. A fitting for allowing lubricant to enter a device and retain said lubricant within said device, comprising:

a main body member having a first passageway extending through said body member;

said first passageway defining first and second seating surfaces;

connection means on one end of said main body member for securing said main body member to a receiving aperture in said device;

a ball member within said first passageway for sealing engagement with said first seating surface;

spring means within said first passageway for biasing said ball member toward said first seating surface;

an upper body member rotatably secured to another end of said main body member and having a second passageway extending through said upper body member;

a valve assembly at least partially disposed within both said first and second passageways and rotatable with respect to said upper body member and axially movable within said upper body member in response to lubricant pressure;

a valve portion of said valve assembly for sealing engagement with said second seating surface in response to rotation of said upper body member relative to said main body member;

main body sealing means for establishing a fluid tight seal between said valve assembly and a cylindrical surface defined by said first passageway through said main body member;

said valve assembly having a third passageway extending through at least a portion of said valve assembly and past said main body sealing means.

4,512,442

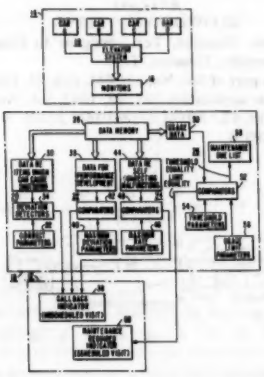
METHOD AND APPARATUS FOR IMPROVING THE SERVICING OF AN ELEVATOR SYSTEM

William H. Moore, Bridgewater Township, Somerville County, N.J.; Alan F. Mandel, Scott Township, Allegheny County, Pa.; William J. Trosky, Wilkinsburg, Pa.; Kenneth M. Eichler, North Versailles, Pa.; Stephen P. Tomas, West Mifflin, Pa.; Edward Tober, Bethel Park, Pa., and Thomas A. Vasold, Morristown, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1984, Ser. No. 595,174

Int. Cl.³ B66B *3/00*

U.S. Cl. 187—29 R **35 Claims**



1. A method of improving the servicing of an elevator system by determining when specific preventive maintenance services are due, and when such maintenance services should be scheduled, comprising the steps of:

monitoring the usage of predetermined elevator system functions,

collecting usage data in response to the monitoring step,

establishing predetermined usage parameters, including both maintenance due thresholds and upper usage limits, for at least certain of the monitored functions,

comparing said usage data with the associated parameters,

placing at least on maintenance required service on a maintenance due list as the usage of the monitored function reaches the associated maintenance due threshold parameter,

and indicating a need for scheduled elevator service, for all of the maintenance services on the maintenance due list, when the usage of one of the monitored functions reaches its associated upper usage limit.

4,512,443

LIFT DOOR CONTROL APPARATUS

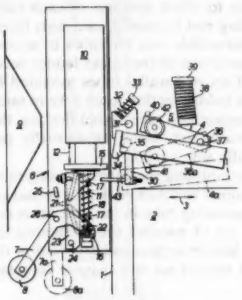
Alan Dewhurst, Hounslow, England, assignor to Dewhurst & Partner P.L.C., Hounslow, England

Filed Mar. 18, 1983, Ser. No. 476,564

Claims priority, application United Kingdom, Mar. 24, 1982, 8208692

Int. Cl.³ B66B *13/20*

U.S. Cl. 187—57 **6 Claims**



1. Apparatus for controlling the movement of a lift car door relative to a lift car, comprising

(a) door locking means operable between locked and normally unlocked conditions;

(b) latch means operable between normally unlatched and latched conditions in which said door locking means is in the unlocked and locked conditions, respectively;

(c) means for releasing said latch means when said lift car is at a given position relative to a floor, said release means including

(1) a release arm pivotally connected intermediate its ends with said lift car for pivotal movement between retracted and normally extended positions relative to the car, one end of said release arm, when in the extended position, being arranged for engagement by a stationary floor ramp adjacent the floor for pivoting said release arm to said retracted position;

(2) a latch release lever pivotally connected with said lift car for movement between normal first and second positions relative to said car;

(3) means connecting said latch lever with said latch means to cause said latch means to be in the latched and unlatched conditions when said latch release lever is in said first and second positions, respectively; and

(4) means connected with the other end of said release arm for pivoting said latch release lever to the second position when said release arm is pivoted to the retracted position, said latch release lever pivoting means including

(a) an electromagnetic actuator connected with said lift car and including an actuator shaft operable between extended and retracted positions when said actuator is de-energized and energized, respectively;

(b) a pair of finger members each having base and finger portions, said base portions containing enlarged openings for loosely mounting said finger members for sliding and pivotal movement on said shaft with the finger portions extending toward each other; and

(c) spring means biasing said finger members apart, one of said finger members being connected with said other end of said release arm to effect relative displacement of said finger members toward each other and subsequent pivoting of said latch release lever to its second position when the release arm is displaced to its retracted position;

(d) said electromagnetic actuator being energizable to retract said shaft to the retracted position and thereby pivot said

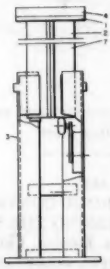
release arm to its retracted position without relative displacement of said fingers and without operation of said latch release lever.

4,512,444

ELEVATOR BUFFER

Werner Koppensteiner, Vienna, Austria, assignor to Otis Elevator Company, Farmington, Conn.

Filed Apr. 11, 1983, Ser. No. 484,113
Claims priority, application Austria, Jul. 6, 1982, 2614/82
Int. Cl.³ B66B *5/28*
U.S. Cl. 187—67 **8 Claims**



1. For use in stopping an elevator car or counterweight, a buffer, characterized by:

(a) a strike plate mounted on a rail;

(b) a housing in which the rail slides vertically;

(c) a brake assembly attached to the housing for providing stopping force upon the rail when the rail moves in one direction, said assembly comprising;

(d) a brake shoe on one side of the rail;

(e) a roller on the other side of the rail;

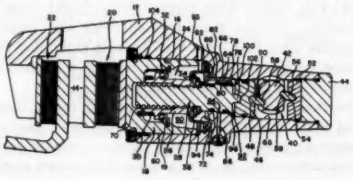
(f) a resilient member on the other side of the rail that forces the roller against the rail, said resilient member being located relative to the rail, to force the rail progressively harder against said shoe as the rail moves in said one direction.

4,512,445

ADJUSTMENT ASSEMBLY FOR A DISC BRAKE

Dean E. Runkle, LaPorte, and James J. Colpaert, Granger, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 1, 1982, Ser. No. 413,857
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—71.9 **4 Claims**



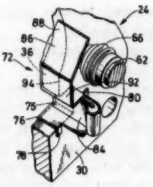
1. An adjustment assembly for a disc brake wherein a caliper includes a stepped bore for receiving a piston, the adjustment assembly comprising a nut cooperating with the piston to limit retraction of the latter upon termination of braking and a threaded stem cooperating with the nut to limit retraction of the nut, the nut being adjustable relative to the threaded stem upon initial braking when the fluid pressure communicated to the caliper is below a predetermined value and the threaded stem being pressure responsive to the fluid pressure communicated to the caliper to substantially limit adjustment of the nut relative to the threaded stem when the fluid pressure communicated to the caliper is above the predetermined value, characterized in that said stepped bore defines a first diameter portion sealingly engaging said threaded stem and a second diameter portion sealingly engaging said threaded stem, said second diameter portion being larger than said first diameter portion whereby fluid pressure acting against said threaded stem above the predetermined level biases said threaded stem to move toward said piston, said threaded stem cooperating with said stepped bore to define a chamber between said sealing engagements and vented to atmosphere and said caliper or threaded stem defining a passage remote from said chamber for communicating fluid pressure acting against said threaded stem at said first diameter portion to said second diameter portion for acting against said threaded stem at said second diameter portion.

4,512,446

PIN-SLIDING CALIPER DISC BRAKE WITH BOOT PROTECTOR

Tsutomu Chuwman, Toyota; Tetsu Hagino, Nagoya, and Shozaburo Tsuchida, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1983, Ser. No. 490,168
Claims priority, application Japan, Dec. 27, 1982, 57-197026[U]
Int. Cl.³ F16D *65/00*
U.S. Cl. 188—73.38 **16 Claims**



1. A disc brake for a vehicle having a wheel, comprising:

a disc rotor having friction surface on opposite sides thereof and rotatable integrally with said wheel;

a pair of brake pads disposed on said opposite sides of the disc rotor;

a torque member movably supporting said pair of brake pads toward and away from said friction surfaces of the disc rotor along an axis of rotation thereof, said torque member supporting at least one boot and receiving a frictional drag torque force from said brake pads;

a caliper straddling said brake pads and a peripheral portion of said disc rotor and having on one side thereof a hydraulic cylinder;

at least one slide pin extending along said axis of the disc rotor from one of said caliper and said torque member and slidably engaging mating bores formed in the other of said caliper and said torque member to thereby guide said caliper along said axis; at least one boot enclosing exposed portions of said at least one slide pin between said torque member and said caliper; and a liner made of sheet-like material and radially disposed in at least one clearance formed between side end surfaces of said brake pads and torque receiving surfaces of said torque member opposite to said side end surfaces, said liner being fixed to said torque member and providing a sliding surface for said brake pads; and

a boot protector including means for protecting said at least one boot against damage thereof due to heat applied thereto from a heat source including one of said brake pads which is located on the same side of said disc rotor as said at least one boot, said boot protector including a first

extension of said liner extending more than 5 mm along said axis of the disc rotor away from one of said torque receiving surface remote from said disc rotor axially thereof, said first extension of the liner radially extending between said at least one boot and said one of the brake pads.

4,512,447

HYDRAULIC DAMPER

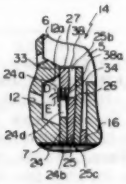
Ieaki Miura, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Dec. 16, 1982, Ser. No. 450,546

Claims priority, application Japan, Dec. 18, 1981, 56-189560[U]

Int. Cl.³ F16F *9/348*

U.S. Cl. 188—322.15 **2 Claims**



1. A hydraulic damper comprising:
a cylinder containing hydraulic liquid therein;
a piston working in said cylinder and partitioning the interior of said cylinder into first and second liquid chambers;
a piston rod secured to said piston and extending to the exterior of said cylinder;
a disc valve mounted on each side of said piston for generating damping forces;
said disc valve exposed to said first liquid chamber comprising at least three mutually overlapping annular discs;
the outer circumference of a first said disc which is located contiguous to said piston being easily deflectable;
a second said disc which is located contiguous to said first disc having at least one opening, one end of which is communicated permanently with said first liquid chamber;
said opening being closed by said first disc when said piston moves toward said second liquid chamber, and said opening being opened due to deflection of said first disc when said piston moves toward said first liquid chamber; and
said first disc having large and small diameter coaxial annular portions which are integrally connected by at least one radial bridge portion, whereby said large diameter annular portion can easily deflect with respect to said small diameter portion.

4,512,448

SYSTEM FOR EQUILIBRATING AN IMBALANCE COUPLE AND USE OF SUCH A SYSTEM FOR EQUILIBRATING AN AIRBORNE RADAR ANTENNA

Bernard Estang, Paris, France, assignor to Thomson-CSF, Paris, France

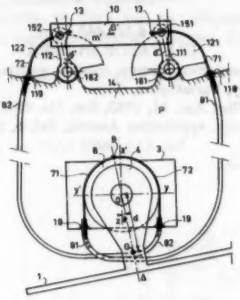
Filed Sep. 16, 1982, Ser. No. 418,837

Claims priority, application France, Sep. 25, 1981, 81 18137

Int. Cl.³ F16D *63/00*

U.S. Cl. 188—378 **8 Claims**

1. An apparatus for remotely equilibrating an imbalance couple comprising:
pivoting means mounted in cantilever relation to its axis of rotation for rotational movement;
a pulley attached to said pivoting means and having a rotational axis coincident with the rotational axis of said pivoting means;
an equilibrating mass mounted detached from said pivoting means and remote therefrom; and
transmission means coupling said pulley to said equilibrating mass whereby the rotational movement of said pivoting



means is transferred to a proportional and antagonistic movement of said equilibrating mass.

4,512,449

FRONT COVER FOR A TORQUE CONVERTER AND METHOD OF PROCESSING THE SAME

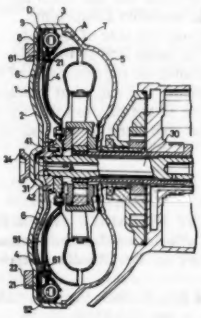
Jiro Motomura, Anjo; Yasuhisa Kamiya, Chita, and Seiichi Nishikawa, Ioyokawa, all of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Feb. 5, 1982, Ser. No. 346,212

Claims priority, application Japan, Feb. 10, 1981, 56-18303

Int. Cl.³ F16H *45/02;* F16D *3/12*

U.S. Cl. 192—3.28 **2 Claims**



1. A front cover for a torque converter comprising:
a front wall portion to be connected coaxially to an output shaft of an engine press-formed from a metal plate;
a connecting portion press-formed from said metal plate integrally with said front wall portion extending from an outside periphery thereof and having a predetermined radius of curvature in cross section;
a cylindrical peripheral portion press-formed from said metal plate integrally with said front wall portion and connecting portion extending from an outside periphery of said connecting portion at a predetermined angle with respect to said front wall portion;
a flat annular surface formed on an inside surface of said front wall portion and a boundary portion connecting an outside periphery of said flat annular surface to an inside periphery of said connecting portion at an inside surface thereof having a smaller radius of curvature in cross section than that of said connecting portion; said flat annular surface and inner surface of said boundary portion having increased hardness and more compact metallographic

structure in the surface thereof and a reduced thickness thereof in comparison with rest of the part of said front wall portion.

4,512,450

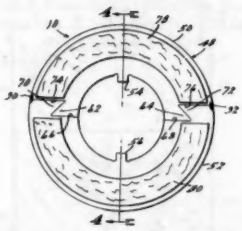
CLUTCH BRAKE

Daniel A. Babcock, 4609 Wilcox, Holt, Mich. 48842

Continuation-in-part of Ser. No. 317,484, Nov. 2, 1981, abandoned. This application May 28, 1982, Ser. No. 383,252

Int. Cl.[3] **F16D** *69/00, 13/68*

U.S. Cl. 192—12 R **5 Claims**



1. A clutch brake comprising, in combination, an annular base including first and second sections, said first and second sections each being substantially flat and having spaced substantially parallel opposite side surfaces, said first and second sections each being generally semiring shaped whereby said first and second sections each include opposite end portions, the opposite end portions of said first section defining a pair of radially disposed teeth within the confines of the inner and outer edges of the semiring shape of said first section and selectively received in a pair of complementary shaped recesses defined by the opposite end portions of said second section, the opposite end portions of said second section defining a pair of radially disposed teeth within the confines of the inner and outer edges of the semiring shape of said second section and selectively received in a pair of complementary shaped recesses defined by the opposite end portions of said first section, said teeth and recesses being selectively engaged and interlocking said first and second sections against movement with respect to each other in any radial direction, a plurality of friction facings secured to the opposite side surfaces of said first and second sections, said first and second sections also each including an integral radially inwardly projecting tang portion, and means disposed entirely between said opposite side surfaces of said first and second sections and selectively connecting the adjoining end portions of said first and second sections to each other to form a unitary structure.

4,512,451

SINGLE LEVER CONTROL ASSEMBLY TO PERMIT DISENGAGEMENT BETWEEN TWO FUNCTIONS

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed Jun. 21, 1982, Ser. No. 390,243

Int. Cl.[3] **B60K** *41/02;* **G05G** *9/08*

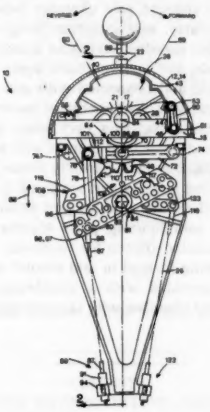
U.S. Cl. 192—0.096 **25 Claims**

1. A control lever assembly having: a body; a lever mounted for rotation about a lever axis relative to the body, and for axial movement along the lever axis relative to the body between engaged and disengaged positions; and first and second signal output means mounted for rotation relative to the body, the assembly being characterized by:

(a) interrupter driving means cooperating with the first signal output means and with the lever and being responsive to the rotation of the lever,

(b) interrupter driven means cooperating with the second signal output means and being engageable with the interrupter driving means when the lever is in the engaged position so that the driven means is responsive to at least a portion of the rotation of the lever,

(c) selector means to permit axial movement of the lever between the engaged and disengaged positions when the lever is in a particular position only, the selector means having a projection and a wall member, the projection being mounted for rotational movement with the interrupter driven means, the wall member being mounted for axial and rotational movement with the lever, the wall



member having a clearance opening of a size adapted to pass the projection when aligned therewith during the axial movement of the lever in the particular position, and to interfere with the projection when non-aligned, so that the axial movement permits disengagement between the driven means and the driving means, and when so disengaged to permit rotation of the lever and the interrupter driving means with no corresponding movement of the second signal output means.

4,512,452

SLIP CLUTCH

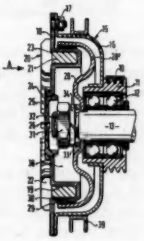
Rudolf Babitzka, Kirchberg; Gottlob Haag, Jettingen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,663

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029627

Int. Cl.[3] **F16D** *43/18, 13/72*

U.S. Cl. 192—104 C **12 Claims**



1. A slip clutch for transmitting torque between a drive motor having an output member and a generator having an input member, comprising a transmitting element rotatable about an axis and arranged to transmit torque from the output

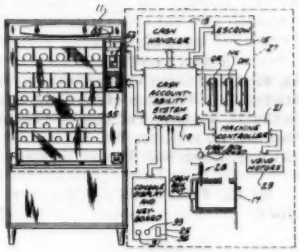
member of the drive motor to the input member of the generator with limitation of a rotational speed under the action of a centrifugal force acting upon said transmitting element, said transmitting element being connected with one of said members and including a spring element; a friction element provided on said spring element and arranged so that said spring element presses said friction element against the other of said members with a prestress; means forming a substantially closed fluid-tight chamber which is symmetrical relative to said axis of rotation and accommodates a fluid and said spring element and said friction element, said chamber being partially filled with oil; a ventilator, said members being first and second members, said first member having an annular groove and an outer exposed side, and said ventilator being arranged on said outer exposed side and connected with said first member for joint rotation therewith, said ventilator having a ring part and a plurality of vanes, said ring part being inserted into said annular groove and connected therein with said first member; and a housing which at least partially forms said transmitting element and has one housing part arranged to face toward said input member and another housing part arranged to face away from the latter, said housing parts together bounding said chamber, said annular groove for receiving said ring part of said ventilator being formed in said second housing part, said housing being provided with a ventilating opening which communicates said chamber with the exterior of said housing.

4,512,453

VENDOR ACCOUNTABILITY SYSTEM

James T. Schuller, St. Louis County; Paul K. Griner, St. Louis, and Nai H. Mak, Maryland Heights, all of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 24, 1982, Ser. No. 423,073
Int. Cl.³ G07F 9/08
U.S. Cl. 194—1 N **122 Claims**



1. An accountability system for a vendor having means for handling cash deposited, means for holding coins for delivery in change to a customer, and a cash box, said handling means being adapted to accept said coins and deliver them to the coin holding means if needed, otherwise to deliver them to the cash box, said system comprising:

a memory for storing data on the amount of cash which should be retained in the vendor out of cash deposited in the vendor, and also data on the amount of coin delivered to and delivered from the coin holding means; and

logic means for controlling input of data to and retrieval of data from the memory;

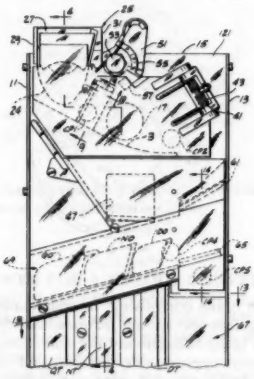
said logic means being operable to update in the memory said data for computation of the amount of cash which should be turned in by one who collects cash from the vendor.

4,512,454

COIN APPARATUS HAVING COIN ESCROW AND RETURN MEANS

James T. Schuller, St. Louis County; Barry L. Smith, Florissant, and Paul K. Griner, Maryland Heights, all of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Continuation of Ser. No. 316,078, Oct. 29, 1981, abandoned.
This application Jan. 10, 1984, Ser. No. 569,613
Int. Cl.³ G07F 5/16
U.S. Cl. 194—1 D **15 Claims**



1. Coin apparatus for use in a vendor and for handling coins deposited in the vendor and for making change, comprising:

a plurality of change tubes, one for each of a plurality of denominations of coins that may be deposited in the vendor, each of said tubes being adapted to hold a supply of coins of a respective denomination, and adapted to have coins drop into it for stocking it with coins;

each of said change tubes having associated with it means for sensing the stocking of the tube with coins up to a predetermined amount;

coin sorting means for sorting coins of said denominations and delivering to each change tube coins of the denomination for that tube;

means for holding coins in escrow for delivery either to a cash box or to a return system of the vendor;

an accept/return gate movable between a closed position for delivery of unacceptable items deposited in the vendor to the return system of the vendor and an open position for acceptance of a coin for delivery of the coin either to the coin sorting means or the escrow means,

a coin sorting/escrow gate above the escrow means and below the accept/return gate movable between a closed position for delivery of accepted coins to the coin sorting means and an open position for delivery of an accepted coin to the escrow means,

control means controlled by said sensing means for opening the accept/return gate with the coin-sorting/escrow gate closed for delivery of accepted coins of each denomination to the coin sorting means as long as the change tube for coins of that denomination needs coins to bring the supply therein up to the respective predetermined amount, and for opening the accept/return gate and the coin-sorting escrow gate for delivery of coins of each of said denominations to said escrow means when the respective change tube does not need coins;

means for actuating said escrow means to deliver any coins therein to said cash box upon operation of the vendor by a customer for a vend, and for actuating said escrow means to deliver any coins therein to said return system of the vendor upon operation by a customer of a coin return means of the vendor; and

means operable on operation of said coin return means by a customer for delivering coins from the change tubes to said return system of the vendor in amount corresponding to that deposited by the customer in the vendor and delivered to the change tubes.

4,512,455

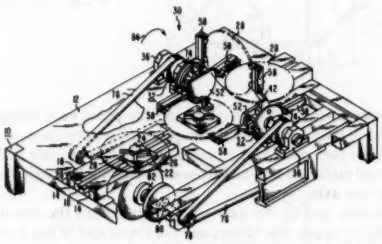
DISC TURNOVER DEVICE

Joseph H. Thorn, and John J. Prusak, both of Marion, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 3, 1983, Ser. No. 538,547

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—404 **12 Claims**



1. An apparatus for turning a disc over comprising

a conveyor for supporting a disc in a flat horizontal position and carrying said disc along a horizontal path,

a pair of spaced parallel arms at opposite sides of said conveyor with each arm being rotatable about a point adjacent one end thereof in a plane parallel to the path of movement of said conveyor,

a pickup head on the other end of each arm and slidable along the arm, and

means for moving said other ends of the arms toward each other to pick up a disc and away from each other to release the disc.

4,512,456

FORCE BALANCED ACTUATOR FOR MECHANICALLY ACTUATED CONTAINER GRIPPERS

John J. Peyton, Santa Barbara, Calif., assignor to Industrial Automation Corp., Goleta, Calif.

Filed Sep. 29, 1982, Ser. No. 428,145

Int. Cl.³ B65G *47/86*

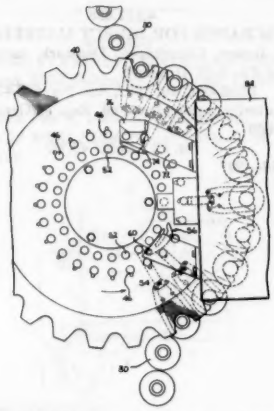
U.S. Cl. 198—479 **10 Claims**

6. A container-conveying apparatus, having a rotating starwheel assembly comprising a pair of spaced substantially circular rotatable disks, each having a plurality of recesses on the periphery thereof, said recesses in each of said disks being aligned whereby containers may be held in said recesses, comprising;

gripper assembly means having gripper means for gripping and releasing containers in response to the position of said first actuating means,

second actuating means fixedly mounted on said starwheel assembly radially inward from said first actuating means and corresponding with said first actuating means,

actuator means stationarily pivotedly supported adjacent said starwheel assembly for responding to engagement with said first actuating means of said gripper means by engaging said second actuating means such that an actuation force is provided by said second actuating means through said actuator means to said first actuating means



for causing said gripper means to grip containers as said disks rotate.

4,512,457

APPARATUS FOR TRANSPORTING CONTINUOUSLY ARRIVING FLAT PAPER PRODUCTS, ESPECIALLY A STREAM OF PRINTED PRODUCTS ARRIVING IN AN IMBRICATED FORMATION

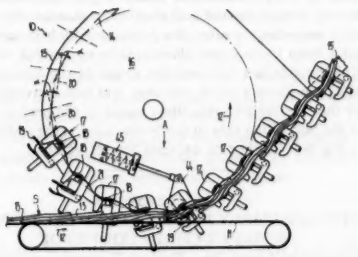
Walter Reist, and Jürg Eberle, both of Hinwil, Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed May 23, 1983, Ser. No. 496,899

Claims priority, application Switzerland, Jun. 2, 1982, 3386/82

Int. Cl.³ B65G *47/86*

U.S. Cl. 198—479 **7 Claims**



1. An apparatus for transporting continuously arriving substantially flat paper products, especially a stream of printed products arriving in an imbricated formation, comprising:

a guided revolvingly driven endless traction means defining a predetermined direction of transport;

controlled gripper units arranged at said traction means in spaced relationship from each other;

each of said gripper units possessing a substantially planar clamping surface;

each of said planar clamping surfaces extending laterally of said traction means and at essentially the same predetermined inclination relative to said predetermined direction of transport of the paper products; and

said gripper units serving to grip a lateral marginal edge of said paper products viewed in said predetermined direc-

tion of transport of the paper products and to thereby impart an undulatory configuration to the imbricated formation of said paper products.

4,512,458

BRIDGE SCRAPER FOR DIRECT MATERIAL FEEDING

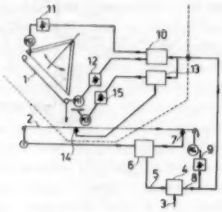
Torkil D. Jensen, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Dec. 10, 1982, Ser. No. 448,427

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149650

Int. Cl.³ B65G *43/00*

U.S. Cl. 198—507 **2 Claims**



1. A bridge scraper for raking material from a storage heap, said bridge scraper comprising a raking device positioned at one end face of the heap, the raking device being mounted on a carriage on a bridge perpendicular to the center line of the storage heap and being moved into the storage heap and to and fro along the base line of the end face of the heap by means of a drive unit; a scraper chain extending parallel to the bridge for raking material onto a belt conveyor, the speed of the conveyor being coupled through control lines with that of the bridge drive unit, the scraper chain and the carriage; a first measuring device and a second measuring device, said first measuring device comprising a belt weigher located near the outlet end of the belt conveyor and adapted to control the speed of said belt conveyor so as to cause a substantially constant amount of material to be discharged from said outlet end per unit of time, said second measuring device comprising a measuring device located and adapted to measure the filling of the belt immediately after the point at which it receives the material from the scraper chain and being further adapted to control the relation between the speed of the bridge and the speed of the scraper chain, carriage and belt conveyor in such a way that the relative travelling speed of the bridge increases when the belt filling rate drops below a set value and decreases when the belt filling rate exceeds the set value.

4,512,459

GUIDE ASSEMBLY FOR A CURVED SECTION OF A SCRAPER-CHAIN CONVEYOR

Bodo Kerklies, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,494

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123374

Int. Cl.³ B65G *19/00*

U.S. Cl. 198—729 **12 Claims**

1. A guide assembly for a curved section of a scraper-chain conveyor, the assembly comprising:

(a) a housing and two pulley wheels which are rotatably mounted within the housing,

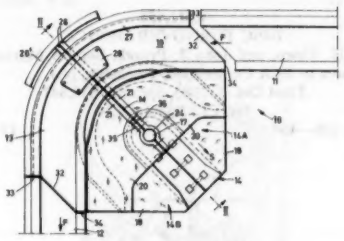
(b) the pulley wheels constituting means for guiding the scrapers of a scraper assembly around a curved section of a scraper-chain conveyor,

(c) each of the pulley wheels having an inner wheel part and a multi-part scraper-engaging rim detachably connected to said inner wheel part,

(d) the pulley wheels being independently rotatably mounted on an axle mounted within the housing,

(e) the housing being formed in two detachably-connected parts and including a base plate arranged beneath the pulley wheels, a cover plate arranged above the pulley wheels, and a panel arranged between the pulley wheels,

(f) the ends of the axle being supported by the base plate and the cover plate,



(g) the base plate, the cover plate and the panel each being formed in two parts, a common plane of separation separating the two parts of the base plate, the cover plate and the panel with said plane of separation passing through the axis of the axle,

(h) the upper end of the axle being held within the cover plate by an upper end fitting, and the lower end of the axle being held within the base plate by a lower end fitting,

(i) each of said fittings being constituted by a pair of semi-cylindrical shells.

4,512,460

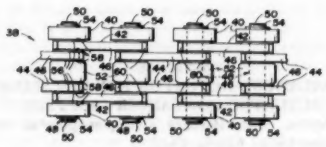
GLASS SHEET ROLLER CONVEYOR INCLUDING ANTIFRICTION DRIVE CHAIN

Ronald A. McMaster, Woodville, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Mar. 30, 1983, Ser. No. 480,223

Int. Cl.³ B65G *13/07*

U.S. Cl. 198—790 **7 Claims**



1. In glass sheet processing equipment including a roller conveyor having elongated rolls extending transversely to the direction of conveyance, a continuous drive loop on which the rolls are supported for frictional driving, and a horizontally extending support surface on which the drive loop is supported and moved to drive the rolls, the continuous drive loop comprising: an antifriction drive chain including antifriction rollers each of which has an annular outer member supported for rolling movement on the support surface; each antifriction roller also including an annular inner member located within the outer member thereof and further including bearing elements that support the inner and outer members for rotation with respect to each other; the antifriction rollers being arranged in laterally aligned pairs spaced along the length of the drive chain; the drive chain including connecting pins each of which has opposite ends received by the inner members of an associated pair of the laterally aligned antifriction rollers; the drive chain including links extending between the connecting

pins and spaced upwardly from the associated support surface in a spaced relationship thereto; and each link having an upper surface that supports and frictionally drives the rolls as the antifriction rollers support the chain for movement on the associated support surface.

4,512,461

APPARATUS FOR PLANARIZING AND STORING HYDROPHILIC CONTACT LENS

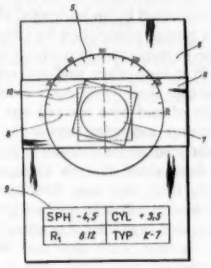
Otto Wichterle, Prague, Czechoslovakia, assignor to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia

Division of Ser. No. 48,895, Jun. 15, 1979, Pat. No. 4,322,139. This application Dec. 11, 1981, Ser. No. 330,022

Claims priority, application Czechoslovakia, Jun. 26, 1978, 4178-78; Jun. 26, 1978, 4179-78; Dec. 4, 1978, 7974-78

Int. Cl.³ B65D *81/22;* **A45C** *11/00*

U.S. Cl. 206—5.1 **6 Claims**



1. Apparatus for converting a spherical hydrophilic toric contact lens swollen in a volatile swelling agent and having its cylindric axis indicated thereon, into a planarized xerogel and for thereafter storing and transporting said lens in the xerogel state comprising a rigid planar or moderately curved base for supporting said lens, said base being provided with an angle scale in the range of 0 degrees to 180 degrees, and being adapted to locate the contact lens above the center of the scale, the cylindric axis of the contact lens lying on the line connecting the angles 0 degrees or 180 degrees with the center of the angle scale and means for removably fixing said lens to said base, said means being permeable to said swelling agent and being capable of compressing said swollen lens to the surface of said base so that said lens assumes the planar or moderately curved shape of the base in the xerogel state.

4,512,462

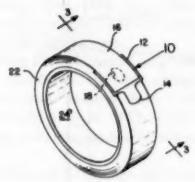
ADHESIVE TAPE TAB

Reuben H. Dills, P.O. Box 12451, Seattle, Wash. 98111

Filed Sep. 26, 1984, Ser. No. 654,960

Int. Cl.³ B65D *85/67*

U.S. Cl. 206—53 **13 Claims**



1. A reusable tab to mark the exposed end of a roll of tape comprising a sheet of nonporous moisture-resistant, adhesive-free material which is adherable to the exposed end of the tape on the adhesive side of the tape to mark the end of the tape when the tape is stored between uses, the tab being removable from the end of the tape and being reusable.

4,512,463

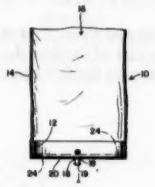
FREE-STANDING FLEXIBLE CONTAINER FOR FLUIDS

Randall W. Ward, 5333 Baltimore Dr. #109, La Mesa, Calif. 92041

Filed Feb. 2, 1984, Ser. No. 576,445

Int. Cl.³ B65D *77/04, 83/00;* **B65B** *39/00*

U.S. Cl. 206—216 **5 Claims**



1. A container comprising:

(a) an annulus portion including a band of material formed into a squat annuluar wall, said band of material being sufficiently rigid to allow said annular wall to be free-standing, said annulus portion having an inner surface and an outer surface;

(b) a base portion which is relatively more flexible than said band of material, said base portion closing the bottom of said annulus portion;

(c) a tubular sidewall portion which is also relatively more flexible than said band of material, said tubular sidewall portion being upwardly extensible from said annulus portion and having a sealable mouth such that said annulus portion, said base portion, and said tubular sidewall portion cooperate to form a fluid-tight container when said mouth is sealed, said base portion and said tubular sidewall portion being of unitary construction and of substantially uniform thickness, wherein said base portion is substantially planar and wherein said sidewall portion joins said base portion at substantially right angles relative thereto, where said annulus portion is attached to said sidewall portion proximate its juncture to said base portion such that only one of said inner surface and said outer surface is in contact with said sidewall portion; and

(d) a drain spout extending from and made contiguous with said annulus portion, said drain spout being operative to drain fluids contained within said container.

4,512,464

METHOD OF FOLDING T-SHIRTS AND FOLDED SHIRT ARRANGEMENT RESULTING THEREFROM

John D. Sylvester, Garden City, N.Y., assignor to Amscomatic, Inc., Long Island City, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,646

Int. Cl.³ B65D *85/18*

U.S. Cl. 206—292 **12 Claims**

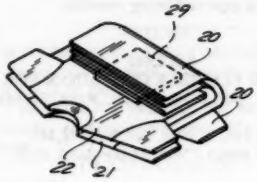
7. An arrangement of folded T-shirts comprising:

(a) at least two shirts each having a top part, a central part, a bottom part, and two sides,

(b) a first of the shirts being folded along two lines parallel to the shirt bottom so that its central part is between its top and bottom parts,

(c) each of the other shirts being folded along two lines parallel to the bottom of that shirt, the bottom and central part of each other shirt being between the bottom and central part of the first shirt,

(d) a stiffener board between the bottom and central part of the shirt farthest from the first shirt, and



(e) the bottom parts and sides of all the shirts being folded between the top part of the first shirt and the top part of the shirt farthest from the first shirt.

4,512,465

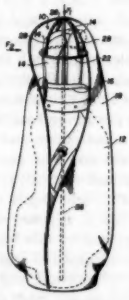
GOLF BAG ACCESSORY

Howard L. Jobe, 6500 Capitol Dr., Greenbelt, Md. 20770

Filed Nov. 22, 1983, Ser. No. 554,287

Int. Cl.³ A63B *55/00*

U.S. Cl. 206—315.4 **12 Claims**



1. A protective device utilized with means for carrying sports equipment, particularly golf clubs, and being operable to protect the golf clubs during travel and/or storage, comprising:

substantially rigid downwardly facing concave club head protecting means for surrounding and enveloping the heads of said clubs, and elongated support means integral with said club head protecting means;

said elongated support means further comprising a central rod member;

said club head protecting means further comprising a base member surrounding said rod member and a plurality of downwardly projecting and upwardly converging connecting members connecting one end of said rod member to said base member;

said rod member being insertable in said carrying means and having a predetermined length such that the overall length of the protective device is greater than the longest club carried, whereby damage occurring as a result of undesired externally applied longitudinal and lateral forces is prevented.

4,512,466

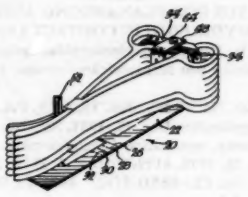
SURGICAL INSTRUMENT ORGANIZER

Theodore G. Delang, 3440 N. Lake Shore Dr., Apt. 11G, Chicago, Ill. 60657

Filed Jul. 5, 1984, Ser. No. 628,022

Int. Cl.³ B65D *85/62*

U.S. Cl. 206—370 **14 Claims**



1. An organizer for instruments of the type having a pair of finger rings each connected by an associated shaft to an associated jaw through a hinged connection for closing and opening the jaws in response to respective movement of the finger rings toward and away from each other, said organizer comprising a base; a pair of elongate finger ring posts extending upwardly from opposite sides of said base toward one end thereof; an elongate jaw separator extending upwardly from said base toward an opposite end thereof from a position generally intermediate said base sides; and an elongate shaft divider extending upwardly from said base intermediate said finger ring posts and jaw separator from a position generally intermediate said base sides, said organizer accommodating placement of the instrument thereon, such that said finger ring posts extend upwardly through associated ones of the instrument finger rings, said jaw separator extends upwardly between open jaws of the instrument and said shaft divider extends upwardly between the instrument shafts, whereby said organizer supports the instrument thereon and prevents the instrument from going from an open to a closed position whereat the finger rings move together and the jaws close.

4,512,467

DRILL-BIT INDEX CASE

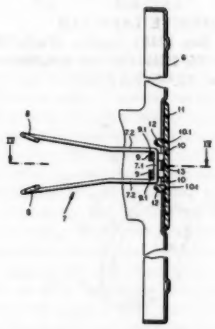
Georg Knoblauch, Giengen, Fed. Rep. of Germany, assignor to Georg Knoblauch GmbH, Giengen/Brenz, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,082

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 8304781

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—379 **8 Claims**



1. A case for holding and displaying objects such as drill bits, the case comprising:

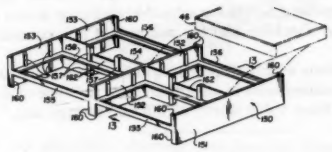
an elongated and upwardly open box;
an insert adapted to hold a plurality of the objects and pivotal in the box about an insert axis between a down position wholly contained therein and an up position projecting upward therefrom;
a U-shaped link having a pair of legs pivoted on the insert and a straight bight portion extending substantially parallel to the axis, interconnecting the legs, and of a predetermined bight length between the legs;
a lid pivotal on the box between a closed position engaging over and closing the box and an open position projecting upward therefrom, the lid being formed with
a pivot loop through which the bight portion passes and which has a pair of outer edges spaced axially apart substantially by the bight length, whereby the bight portion cannot move axially relative to the lid,
a window at the pivot link having a pair of outer edges spaced apart parallel to the axis by a distance greater than the bight length, and
a strut bridging the window parallel to and between the window edges, whereby the bight portion engages against the strut on closing of the lid; and
a cover plate having respective snap tabs spaced apart axially by a distance greater than the bight length and engaged snugly against the window edges.

4,512,468

CASSETTE STORAGE DEVICE

David M. Stravitz, New York, N.Y., assignor to Lebo/Peerless Corp., Bloomfield, N.J.

Filed Nov. 26, 1982, Ser. No. 444,795
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—387 **14 Claims**



1. A cassette case storage device for storing a cassette (**46**) of type including a base portion (**38**) with an upstanding longitudinally extending wall (**38***a*) and first and second upstanding transversely extending walls (**38***b* and **38***c*), mutually longitudinally spaced and having first ends joined to the base portion longitudinally extending wall (**38***a*) and second ends (**38***d* and **38***e*), defining an upstanding longitudinally extending opening therebetween for receipt of a cover (**39**) for said cassette case, said transversely extending walls (**38***b* and **38***c*) including pivots (**38***f*) for supporting said cover for pivotal movement between open and closed positions, said storage device defining a compartment for receiving said cassette case and comprising:

(a) storage device first and second upstanding mutually longitudinally spaced and transversely extending walls (**151**, **152**), bounding said compartment for respective engagement with said cassette case first and second transversely extending walls (**38***b* and **38***c*) for restraining movement of a received such cassette case in longitudinal direction in said storage device;

(b) a first upstanding longitudinally extending wall (**162**) in said storage device bounding said compartment and extending between said storage device first and second transversely extending walls (**151**, **152**) for engagement with said cassette case longitudinally extending wall (**38***a*); and

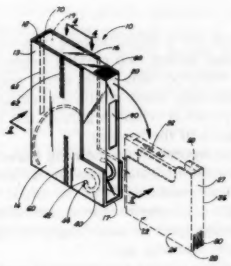
(c) a projection (**160**) in said storage device extending longitudinally from said storage device first transversely extending wall (**151**) for engagement with said second end (**38***d*) of said cassette case first transversely extending wall (**38***b*) for restraining a received such cassette case from movement in the transverse direction in said storage device, while not interfering with such pivotal movement of said cassette case cover.

4,512,469

STORAGE RECEPTACLE FOR ELECTRONIC STORAGE MEDIA

Chester R. West, 1604 Sunburst La., Pineville, La. 71360

Filed Jun. 6, 1983, Ser. No. 501,259
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—387 **3 Claims**



1. A media storage container, which comprises:

a. a primary container having a pair of substantially parallel side walls, a back wall and an open-ended front portion for defining a container space therein;

b. a secondary container means pivotally moveable from an open to a closed position within said space of said primary container, said secondary container having substantially side parallel walls and an open-ended back wall for defining a media storage tape container space therein;

c. double track means, allowing said pivotal movement of said secondary container within said space of said primary container, said double track means further comprising;

i. an arcuate slot cut into the wall of said primary container having its lower portion sloped toward said open-ended front portion of said primary container;

ii. a peg member contained on the wall of said secondary container, said peg member matingly slideable within said slot, as said secondary container changes positions;

iii. a second eccentric semi-circular track cut into the wall of said secondary container and having its open end facing said arcuate slot when said secondary container is in said closed position;

iv. a second peg member positioned on the wall of said primary container accommodated in said second eccentric track as said secondary container moves from opened to closed position;

v. said first peg matingly engaged in said first slot and said second peg matingly engaged in said second eccentric track, together providing said means to move said secondary container from opened to closed positions within said primary container; and

d. means for locking said container in a closed position comprising the rotatable positioning of the open end of said arcuate track on said second peg, effected by the slideable engagement of said first peg member to the lower portion of said arcuate slot.

4,512,470

STORAGE CASE FOR A MAGNETIC-TAPE CASSETTE

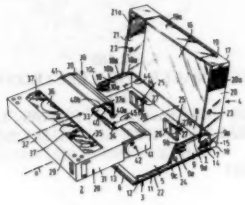
Joannes H. F. C. Sieben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1984, Ser. No. 571,979

Claims priority, application Netherlands, Sep. 5, 1983, 8303077

Int. Cl.³ B65D 85/67, 85/672

U.S. Cl. 206—387 10 Claims



1. A storage case, for a magnetic-tape cassette comprising

a cassette housing having two parallel substantially rectangular major walls, two side walls, a rear wall, a front side with a front opening which continues in at least one major wall, and a partition which separates the front opening from the interior of the housing,

two reel hubs juxtaposed in the housing between the major walls and mounted for rotation about two axes of rotation which extend perpendicularly to the major walls,

a part of a length of magnetic tape wound around said reel hubs and another part of said length of tape stretched across the front opening, and

a front cover which covers the stretched part of the magnetic tape at least at the front side, bounds the front opening at the front side, and is pivotally connected to the housing,

which storage case comprises:

(a) a base section having a rectangular bottom provided with a front edge and a rear edge, an upright rear wall which adjoins the rear edge, and a pair of spaced and parallel upright side walls which extend from the rear wall towards the front edge,

(b) at least one upright positioning element arranged on the bottom, for positioning a magnetic-tape cassette whose front cover faces the rear wall of the base section when the cassette is situated in the case, and

(c) a cover section having a rectangular upper wall provided with a front edge and a rear edge, which rear edge at least substantially adjoins the rear wall of the base section, in the closed position of the cover section; a front wall which adjoins the front edge of the upper wall and, in the closed position of the cover section, at least substantially adjoins the front edge of the bottom of the base section; and a pair of parallel spaced side walls, which extend from the front wall towards the rear edge, the side walls of the cover section being pivotally connected to the side walls of the base section to enable the cover section to be pivoted relative to the base section between an open and a closed position,

characterized in that the positioning element occupies such a location on the bottom of the base section relative to the rear wall that the positioning element extends into the front opening of a magnetic-tape cassette contained in the case, and

the distance at the base, between that side of the positioning element which is remote from the rear wall and the inner side of the rear wall, is greater than the distance between that wall portion of the cassette partition which faces the positioning element and the front of the front cover, in such a manner that a movement of the cassette inside the case towards the rear wall is limited by abutment of the partition with the positioning element, thereby ensuring that the front cover remains clear of the rear wall.

4,512,471

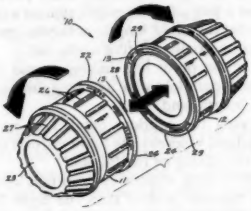
STORAGE UNIT

Robert L. Kaster, Plymouth, and Perry M. Domaas, Brooklyn Center, both of Minn., assignors to Angicor Limited, Minneapolis, Minn.

Filed Apr. 6, 1984, Ser. No. 597,796

Int. Cl.³ B65D 85/02

U.S. Cl. 206—438 10 Claims



1. A storage unit for use in storing a prosthetic heart valve and a plurality of heart valve opening measurement gauges prior to use thereof, comprising:

(a) first and second container units:

(b) connecting means for selectively connecting and disconnecting said first and second container units to and from one another;

(c) first opening means for selectively gaining access to said first container unit but not to said second container unit;

(d) second opening means for selectively gaining access to said second container unit but not to said first container unit; and

(e) object indicia visibly disposed on either of said first and second container units to identify the size and type of said prosthetic heart valve stored within said storage unit.

4,512,472

SUCTION TUBE PACKAGE

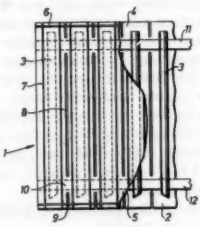
Erik Järund, Fjällbacka, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Oct. 17, 1983, Ser. No. 542,712

Claims priority, application Sweden, Oct. 21, 1982, 8205977

Int. Cl.³ B65D 77/28, 85/08

U.S. Cl. 206—443 6 Claims



1. A suction tube package comprising a pair of flexible strips between which a plurality of suction tubes are placed transversely, said strips being sealed to one another on all sides of the suction tubes and provided with cut portions between the seals, wherein the strips have a width greater than a length of the suction tubes and edges of the strips protrude beyond the length of the tubes; said seals comprising longitudinal seals

which seal longitudinal edge zones of said strips and transverse seals extending along the width of the strips on either side of each Suction tube; said longitudinal and said transverse seals defining closed pockets for each suction tube; said cuts provided parallel to said transverse seals and said closed pockets; a plurality of edge cuts provided in said edge zones transverse to said longitudinal seals; two parallel tapes of a material sealed between the strips extending in a longitudinal direction of the strips at some distance from one another parallel with the longitudinal edges; said tapes extending longitudinally between said cut portions and said edge cuts so as to provide uncut length of said two parallel tapes; said two parallel tapes sealed to said traverse seals so as to prevent tensile stresses from deforming said cut portions and said edge cuts.

4,512,473

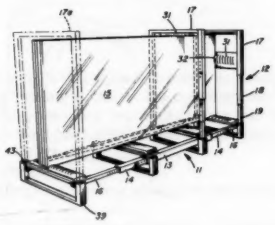
ADJUSTABLE SHIPPING CONTAINER FOR FRANGIBLE SHEET-LIKE UNITS

Ronald J. Thomaswick, Kittanning, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 446,111, Dec. 2, 1982, abandoned. This application Apr. 11, 1984, Ser. No. 599,042

Int. Cl.³ B65D *85/48*

U.S. Cl. 206—454 **5 Claims**



1. An adjustable shipping container for frangible sheets, comprising:

a base, said base having adjustable rigid frame means for altering the length of said base;

a first rigid sheet supporting means removably attached to said base, said first supporting means adjustable for altering the height of said first supporting means relative to said base;

a second rigid sheet supporting means removably attached to said base in spaced relation to said first supporting means, said second supporting means adjustable for altering the height of said second supporting means relative to said base, said first and second supporting means attached to said base to provide spaced enclosures for receiving the sheets and for maintaining the sheets in a substantially vertical position on the base;

sheet edge contacting means attached to each of said first and second supporting means, for maintaining said sheets in spaced relationship to one another;

banding means engaging the base and having its course over said first and second supporting means to urge said first and second supporting means toward the sheets and said base to secure the sheets on the container;

load-bearing loops attached to said banding means;

receiving means attached to said base between said first and second supporting means for receiving and third sheet supporting means to maintain the sheets on edge during loading or unloading the sheets on or from the container; and

load-bearing caster wheels removably attached to said base.

4,512,474

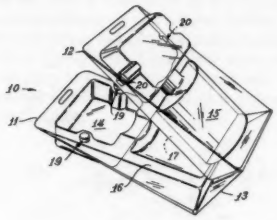
LOCKING MEANS FOR DISPLAY PACKAGE

LeRoy A. Harding, Glen Ellyn, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Dec. 8, 1983, Ser. No. 559,417

Int. Cl.³ B65D *83/10*

U.S. Cl. 206—461 **12 Claims**



1. An improvement for plastic packages of the vacuum-formed type having a first package section closable with a second package section and having means for fastening the sections in a closed position, the improvement comprises locking means having at least one set of resiliently engageable male and female portions respectively integrally formed with said package sections, said male portion having a generally cylindrical side wall, said female portion having a side wall which is polygonal in cross section, the side walls of both said portions having non-positive draft, said male and female portions including engagement means adapted to resiliently contact each other during engagement at spaced-apart points.

4,512,475

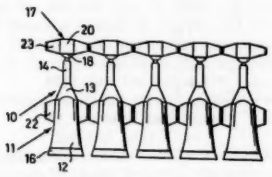
SINGLE OR MULTIPLE DOSE CONTAINER-CLOSURE ASSEMBLIES

Alberto Federighi, Casella Postale Via Carmignani 37, 56100 Pisa, Italy

Filed Nov. 4, 1983, Ser. No. 548,613

Int. Cl.³ B65D *1/08, 17/24;* **B67D** *5/56;* **B65D** *85/62*

U.S. Cl. 206—484 **5 Claims**

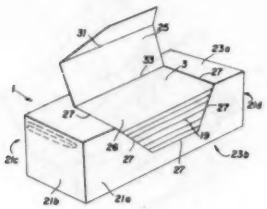


1. A series of injection molded container-closure assemblies, for liquid products characterized by a container consisting of a tubular hollow body portion having a lower side opening which can be sealed by welding and an upper neck closed at the upper side by a stalk and a stopper integrally connected to the discharge end of the container by a stalk provided with means to close the neck of the container after the opening by means of fracturing the stalk, the lateral sidewalls of the container body portion and stopper of each assembly in the series being joined by separate connecting fins, said fins of adjacent assemblies being connected along a fracturable scoreline to facilitate separation of each container-closure of the series.

4,512,476
PLASTIC BAG DISPENSER

F. John Herrington, Jr., Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,725
Int. Cl.³ B65D 83/00; B65H 1/00
U.S. Cl. 206—554 3 Claims

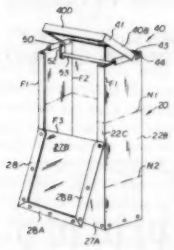


1. A plastic bag dispenser comprising a rectangular shaped box-like housing having four sides and a top and bottom and containing a plurality of stacked and folded plastic bags, each of said bags being individually folded within said housing and not interlocked with another bag, said dispenser including a rupturable line extending along said top and an adjacent side edge which, when ruptured, provides an opening in said housing at a corner and extending along said top and adjacent side edge, exposing said bags for removal from said dispenser, said bags being folded into thirds and a fold line of said bags being exposed by said opening.

4,512,477
READILY ERECTABLE WARDROBE CABINET AND A MODE OF PACKAGING THE SAME

Mark S. Densen, 18 Blackburn Place, Summit, N.J. 07901

Filed Apr. 8, 1983, Ser. No. 483,300
Int. Cl.³ B65D 85/18
U.S. Cl. 206—577 6 Claims



1. A knock-down wardrobe cabinet comprising

a pair of substantially identical blanks of sheet material having transversely extending foldlines to define in the folded position a half back panel, an adjacent side panel, and a front connected flange,

a blank formed of readily foldable material to define a bottom panel having hingedly connected thereto circumscribing side, front and back flanges disposed normal to said bottom panel,

a blank of readily foldable material to define a front panel adapted to be connected to said front flanges,

said front panel having a transversely extending foldline intermediate the top and bottom thereof about which said front panel can be folded between an open and closed position,

and a blank of foldable sheet material defining a top panel, said top panel having a transversely extending foldline about which said top panel is hingedly folded between an open and closed position,

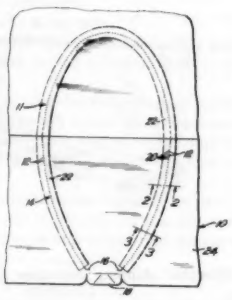
and said top panel having a depending front flange connected thereto whereby said top panel front flange in the closed position of said top panel overlie the upper edge of the front panel in the closed position thereof to effect the closure of said wardrobe,

and including a hanger rod, and support means for detachably supporting said hanger rod between the side panels, said support means including a reversely bent rod support fitted on the upper edge of said respective side panel, a hanger strap, and means for connecting said rod support and hanger strap to the respective corresponding side panel, and said hanger rod being supported on and between said hanger straps.

4,512,478
PAPERBOARD CARTON WITH IMPROVED PERFORATED OPENING AND METHOD OF MAKING SAME

Ralph J. Korte, Darien, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 429,802
Int. Cl.³ B65D 5/72
U.S. Cl. 206—611 10 Claims



1. A blank of fibrous paperboard material for forming a container, said blank including opposed first and second surfaces, the first surface being a printed indicia bearing surface for defining the outside of said container, the second surface for defining the opposed inside of said container, said blank including an opening member defined by an array of spaced die-cut perforations, said blank including a coating of plastically deformable material disposed on and partially penetrating into the second surface of said blank, said coating defining a continuous strip extending along and to each side of said array of perforations, each said die cut perforation extending entirely through said blank and through said coating, whereby when said blank is erected to form a container and when a force is exerted on said opening member to remove said opening member from said container, said coating being of a plastically deformable and readily rupturable material inhibits uneven tearing of the opening member and said fibrous paperboard material and further inhibits disengagement of slivers of fibrous paperboard material therefrom.

7. A method for producing a paperboard container having an improved removable opening member, said method comprising the steps of:

providing a planar sheet of fibrous paperboard material;

coating one surface of said planar sheet with a continuous strip of flowable material which when dried is plastically deformable and readily rupturable, said strip being coated conforming generally to the size, configuration and location of the opening member;

allowing said flowable material to partially penetrate said

planar sheet of fibrous paperboard material and dry thereon to define a coating of plastically deformable material;

die-cutting an array of perforations through said planar sheet of fibrous paperboard material and through said strip of coating to define said opening member; and

forming said container from said planar sheet of fibrous paperboard material.

4,512,479

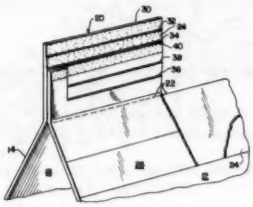
CONTAINER WITH EASY OPENING CLOSURE

Paul O. Hain, Hamilton, and J. George Lepisto, Middletown, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 419,736, Sep. 20, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,183

Int. Cl.³ B65D *33/18*

U.S. Cl. 206—632 **4 Claims**



1. In a container having a body portion, an opening in said body portion providing access to the container interior, and a fold-over flap for extending over and closing said opening by being adhered to said body portion, the improvement comprising:

seal means including:

a layer of adhesive extending along the entire length of said flap, and

an abhesive coating of material which will reduce, but not eliminate, the adhesive bonding strength of said adhesive on at least a portion of the body portion of said container which is overlapped by the flap,

whereby said flap can be easily separated from said body portion, while effectively sealing the container along the entire width of said flap prior to opening,

said abhesive coating being selected from the group consisting of kaolin clay and pearl starch.

4,512,480

ARTICLE HOLDING DEVICE

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Aug. 11, 1983, Ser. No. 522,406

Int. Cl.³ B42F *17/00*

U.S. Cl. 211—11 **30 Claims**

1. A device which comprises:

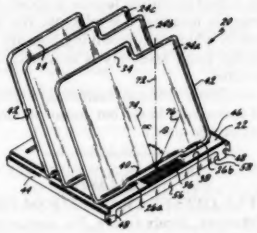
a base module;

said base module including a support surface, said support surface having a top side and an under side;

said support surface including at least one elongated opening extending through said support surface between said top side and said under side;

at least one tilt plate, said tilt plate having peripheral edges, one of said edges including at least one tab means located thereon, said tab means sized and shaped so as to be positionable in said opening with at least a portion of said tab means extending beyond the underside of said support surface, said tab means movable within said opening along the elongated dimension of said opening in response to movement of said tilt plate along said elongated dimension and when said tab is so positioned in said opening at least a portion of said one edge of said tilt plate being located against said support surface so as to support said tilt plate on said support surface;

at least one stop means located on said under side of said support surface in association with said opening, said portion of said tab means which extends beyond said under side of said surface abutting against said stop means when said tilt plate is oriented at an acute angle to a line which is perpendicular to said support surface, said abutting of said tab means and said stop means maintaining said tilt plate from tilting beyond said acute angle while allowing said tilt plate to freely move between said acute angle and a position wherein said tilt plate is perpendicular to the support surface;



at least one lock means located on said underside of said support surface in association with said opening, said lock means for engaging with and locking said tab means, said tab means moving between an unlocked position and a locked position with respect to said lock means as said tab means moves back and forth within said elongated opening in response to movement of said tilt plate along the elongated dimension of said opening, said lock means locking said tab means when said tab means is in said locked position so as to inhibit movement of said tilt plate between said perpendicular position and said acute angle and when said tab means is in said unlocked position said tilt plate freely movable between said perpendicular position and said acute angle.

4,512,481

MERCHANDISE DISPLAY HOOK

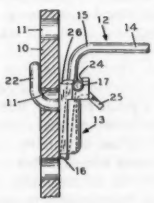
David R. Thalenfeld, Beachhurst, N.Y., assignor to Trion Industries, Inc., Wilkes-Barre, Pa.

Division of Ser. No. 303,419, Sep. 18, 1981, Pat. No. 4,436,209, which is a continuation-in-part of Ser. No. 151,357, May 19, 1980, Pat. No. 4,351,440, which is a continuation-in-part of Ser. No. 918,483, Jun. 23, 1978, abandoned. This application Sep. 19, 1983, Ser. No. 533,342

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—57.1 **4 Claims**



1. In a two-part display hook assembly or the like of the type adapted for mounting on a display panel provided with mounting apertures

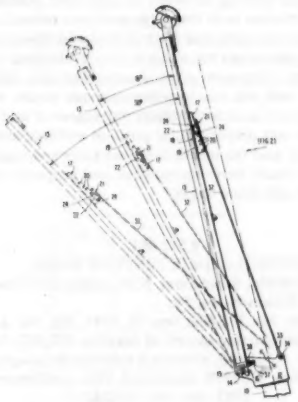
(a) a merchandise support element or the like provided with a generally vertically extending stabilizing portion,
(b) said stabilizing portion being disposed, when said assembly is installed on a display panel, in confronting and contacting relation to said panel,
(c) horizontal hinge bar means secured to said stabilizing portion between the upper and lower extremities thereof and defining a hinge axis,
(d) a base member having rearwardly and upwardly projecting L-shaped mounting lugs for mounting said base member to an apertured display panel and having hinge bar receiving recess means formed therein,
(e) said hinge bar means being received in said recess means to provide for pivoting movement of said base member relative to said support element about said hinge axis,
(f) said recess means being so located with respect to the bottoms of said mounting lugs as to locate the hinge axis of said hinge bar means at a level above the tops of the panel apertures in which said mounting lugs are received, when said display hook assembly is mounted on an apertured display panel,
(g) said stabilizing portion including a portion extending upward above said hinge bar means in close proximity to the front of said panel.

4,512,482

MULTIPLE OFFSET CRANE BOOM EXTENSION

William R. Mentzer, Shady Grove, Pa., assignor to Kidde, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 371,133, Apr. 23, 1982,. This application Feb. 15, 1983, Ser. No. 466,625
Int. Cl.³ B66C *23/62*
U.S. Cl. 212—188 **4 Claims**



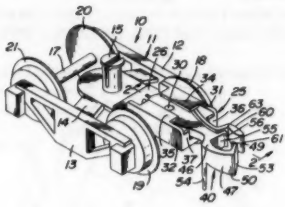
1. In a crane boom having a nose assembly and a jib having its base pivotally supported on said nose assembly for swinging movement to multiple offset use positions relative to the axis of said boom, the improvement comprising, a single fixed length of cable for supporting said jib in said selected offset use positions, said cable being reversely bent on itself to form a loop intermediate the ends thereof, the ends of said cable being attached to the nose assembly in spaced relationship to the pivot axis of said jib, a guide element, said cable loop engaging said guide element, mounting means secured to said jib near the forward end thereof, means adjustably connecting said guide element to said mounting means, whereby the guide element can be adjusted relative to the mounting means, while the end of the jib is supported in proximity to the ground, to thereby vary the distance between the cable loop and ends thereof while the cable is slack, thereby adjusting the effective length of the cable loop, whereby the cable loop becomes taut when the crane boom is lifted to thereby support the jib in a selected angular offset position; said mounting means being at a forwardly convergent angle to the axis of the jib and defining a plane in which the cable loop lies when taut and defining an angle of convergence of the cable loop with the axis of the jib which is constant in all offset positions of the jib, whereby crimping of the cable is prevented.

4,512,483

MODEL TRAIN COUPLER

David W. Crossley, Maple Shade, N.J., and Peter Van Dore, Elkins Park, Pa., assignors to Mantua Metal Products Co., Inc., Woodbury Heights, N.J.

Filed May 20, 1983, Ser. No. 496,613
Int. Cl.³ A63H *19/18*
U.S. Cl. 213—75 TC **9 Claims**



1. A model train coupler for a truck including an outwardly opening pocket and a vertically retractile upright pin in said pocket, said coupler comprising an elongate stem having one end insertable into said pocket and having a receiver for rotatably receiving said pin to mount said stem for swinging movement about the axis of said pin, a hook extending outwardly from the other end of said stem away from said pocket, said hook facing inwardly toward said stem and having a lateral opening toward one side, an undercut protrusion on the end of said hook extending inwardly into said opening, an actuator depending from said hook on the other side from said opening, and a guide on said one side of said hook extending partially across said opening and resiliently mounted on said stem for yieldable movement away from said opening, said guide having a laterally inner operating surface configured for engagement with a hook of a like coupler to interengage the hooks upon movement toward each other with the hook protrusions in interfering engagement to resist lateral separation of the coupled hooks when the cars of a train are extended apart, and said actuator and the actuator of a like coupler being engageable with a track cam when the train is decelerated in the forward direction or being pushed in reverse to compress the cars of the train to disengage the protrusions and spread the interengaging hooks laterally apart from each other against the yieldability of said guides for uncoupling the couplers, said guide being entirely clear on its underside to remain spaced from the track cam at all times.

4,512,484

LOCKING SCREW CAP

Bob Mar, 1025 Rosemarie La., Apt. D-8, Stockton, Calif. 95207

Filed Mar. 3, 1982, Ser. No. 354,263
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—221 **8 Claims**

1. A system for sealing containers, said system comprising:
a container having a threaded opening and at least one lug formed adjacent said opening;
a screw cap capable of threadably engaging the threaded opening to seal the container;
a bracket formed at the periphery of the cap; and

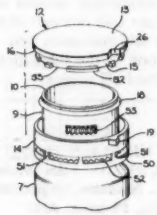
a pin slidably received in the bracket and having means at one end for engaging the lug, so that in an extended position the pin engages the lug to prevent rotation of the cap and in a retracted position the cap is free to rotate.

4,512,485

TAMPER RESISTANT AND TAMPER EVIDENT CLOSURES

Albert J. Agbay, Worcester, Mass., and Ralph H. Thomas, Sr., Clark, N.J., assignors to Robert Linkletter Associates, Inc., Westboro, Mass.

Filed Mar. 29, 1984, Ser. No. 594,723
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—225 **20 Claims**



1. A safety closure for a container having a rim defining a mouth, a neck located below said rim, and a peripheral lip around said rim, said closure comprising:

a snap cap having a top overlying said mouth and said rim and having a depending annular flange projecting below said top, said flange having an inwardly directed circumferential bead engaged below said lip, and a first outwardly directed circumferential bead located below said top and cooperating therewith to define a circumferential locking groove extending around the outer side of said flange;

a rotary safety ring having an annular sidewall surrounding said flange and overlying said locking groove and said first outwardly directed circumferential bead, said annular sidewall being closely spaced to said locking groove and said first outwardly directed circumferential bead so that said inwardly directed circumferential bead is held in engagement with said lip and prevents removal of said cap;

a plurality of angularly spaced fingers on the inner side of said sidewall projecting into said locking groove and overlying the bottom wall of said locking groove to prevent downward movement of said safety ring along said cap, said fingers being inclined inwardly and downwardly into said locking groove and having free inner ends positioned to be wedged against the bottom of the locking groove to prevent free flexing of the fingers as the safety ring is pulled downwardly relative to the cap, thereby normally preventing downward movement of said safety ring out of overlying relation with said locking groove;

a plurality of longitudinally extending release grooves in said first outwardly directed circumferential bead, spaced and sized to permit movement of said fingers through said first outwardly directed circumferential bead in one angular position of said safety ring about said cap, and thus allowing downward movement of said safety ring away from said cap for the removal of said cap from the container in said one angular position;

a locking member located below said rotary safety ring and having a first engaging means;

a second engaging means located on said neck and engaging said first engaging means so that said locking member cannot be rotated relative to said container;

a connection between said safety ring and said locking member preventing said safety ring from rotating,

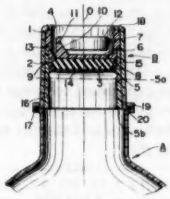
whereby, when said rotary safety ring is locked and out of alignment with said snap cap, said closure cannot be opened without breaking said connection.

4,512,486

STOPPER ASSEMBLY FOR MEDICAL LIQUID CONTAINER AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Hiroshi Kobayashi, Abiko, and Michio Kousaka, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 428,426
Claims priority, application Japan, Nov. 16, 1981, 56-183382
Int. Cl.³ B65D *51/20, 41/50, 47/36*
U.S. Cl. 215—249 **3 Claims**



1. A stopper assembly for a medical liquid container, comprising an inner cylindrical stopper member formed of a plastic material, a rubber plug member hermetically contained in a chamber formed within said inner stopper member by first and second partition walls, said second partition wall being thinner than said first partition wall and sealing said rubber plug member from contact with a liquid in the container, said first partition wall being provided with an annular score, said second partition wall being formed at a position spaced from a base portion of the stopper assembly a distance sufficient enough to reduce heat transfer thereto from the base portion upon heat sealing thereof, an outer cylindrical stopper member formed of a plastic material and hermetically welded around and surrounding said inner stopper member, a pulling member formed in said first partition wall at a region enclosed by said annular score and being disposed and enclosed in the inner cylindrical stopper member; said outer stopper member having an inner flange formed at the top end thereof and an outer flange formed at the bottom end thereof, said inner flange covering the top end of said inner stopper member, said outer flange being welded to an outer flange formed at the bottom end of said inner stopper member, both of said outer flanges being hermetically welded to a top end of the mouth of said container.

4,512,487

BOTTLE STOPPER

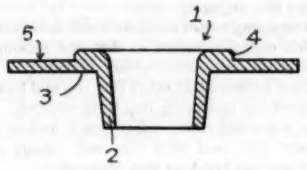
Jacques Augros, Villiers le Bel, France, assignor to Arts Et Techniques Nouvelles, Paris, France

Continuation of Ser. No. 440,178, Nov. 8, 1982, abandoned. This application Aug. 16, 1984, Ser. No. 641,434

Claims priority, application France, Nov. 10, 1981, 81 21099

Int. Cl.[3] **B65D** *41/18*

U.S. Cl. 215—274 **12 Claims**



1. A neck adapter for a bottle with a neck formed with a pouring rim, which comprises:

a sleeve-holding plate having a downwardly depending internal stopper-receiving sleeve defining an internal opened channel providing means for receiving a stopper and encircled at an upper part by an external peripheral flange, said sleeve having an open top and open bottom to provide a through passageway, said sleeve-holding plate being formed of a flexible material, said sleeve-holding plate designed to rest in a tight manner on said pouring rim of said bottle, and

a cap formed with an external skirt provided for fastening said sleeve-holding plate and said cap to said bottle, said cap comprising an inner peripheral rim defining a central orifice which covers at least a part of said external peripheral flange of said sleeve-holding plate, said cap being formed of a relative rigid material, said sleeve-holding plate and said cap joined together to operate as an integrated stopper device for receiving a stopper in said internal opened channel of said stopper-receiving sleeve of said sleeve holding plate.

4,512,488

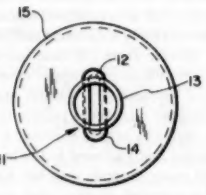
SEALING TUBULATION AND METHOD

Tyrone D. Schwenk, Fallston, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 382,505, May 27, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 581,451

Int. Cl.[3] **H01J** *9/26, 19/54;* **H01K** *3/12, 1/36*

U.S. Cl. 220—2.2 **8 Claims**



1. An enclosure for sealing components comprising:

an airtight envelope having an exhaust opening in one wall; and

separate airtight tubulation means including a bore having one end sealed to the perimeter of said opening to form a passage, said opening having two opposing curved sections joined by two closely spaced sides wherein the width is narrower in one dimension than the other,

said tubulation means having a like narrower width cross-section in one dimension corresponding to said opening with two opposing curved sections joined by two closely spaced sides at said one end and a round cross-section at the other end, the overall cross-sectional area of said tubulation means bore being substantially unchanged from said one end to said other end, said tubulation having an integral structure of a uniform material throughout and being adapted to be pinched off across said narrower width adjacent said one end and envelope to create a vacuum seal for said enclosure, said opening having a shape and dimensions substantially equal to said one end of said tubulation.

6. A method of making an enclosure for sealing components comprising:

supporting an airtight envelope including components to be sealed therein, said envelope having an exhaust opening in a wall, said exhaust opening having one dimension narrower than the other dimension;

sealing to the perimeter of said exhaust opening a separate airtight tubulation member including a bore having a cross-section narrower in one dimension than the other and of substantially the same shape and dimensions at one end as said opening to form a passage and having a substantially round cross-section at the other end, said tubulation being of an integral structure and a uniform material throughout and having an overall cross-sectional area of said bore substantially unchanged from said one end to said other end;

exhausing said envelope through said tubulation member;

pinching off said tubulation member across said narrower dimension adjacent said one end and envelope to form a vacuum seal for said enclosure; and

removing the portion of the tubulation member extending beyond the pinched off section.

4,512,489

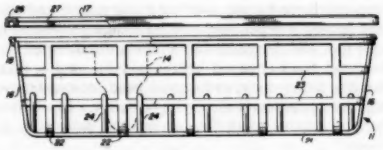
NIPPLE HOLDER

Jacqueline M. Green, 2956 W. Villa Maria Dr., Phoenix, Ariz. 85023, and Jody L. Numbers, Scottsdale, Ariz., assignors to Jacqueline M. Green, Phoenix, Ariz.

Filed Mar. 16, 1984, Ser. No. 590,159

Int. Cl.[3] **B65D** *6/08, 1/36;* **A47G** *19/08;* **B08B** *13/00*

U.S. Cl. 220—19 **7 Claims**



1. A device for holding a plurality of baby bottle nipples for washing comprising, a rim member having opposed side portions and opposed end portions arranged in a flat plane, a plurality of spaced U-shaped longitudinal members each having a generally flat intermediate region and upwardly extending end regions, the end regions of each of said longitudinal members being joined to said end portions of said rim members, a plurality of spaced U-shaped transverse members each having a generally flat intermediate region and upwardly extending end regions, the end regions of each of said transverse members being joined to said side portions of said rim member, the intermediate regions of said longitudinal members intersecting the intermediate regions of said transverse members to form a first foraminous face of said device spaced from the plane of said rim member, a plurality of sets of protuberances disposed on the intermediate regions of said longitudinal

members and said transverse members, each of said sets comprising four equal-spaced protuberances surrounding an intersection between a transverse member and a longitudinal member, the space between the protuberances of each set being slightly in excess of the diameter of the head of a nipple and the spacing between nearby sets being greater than the diameter of the base of the nipple, whereby said sets of protuberances receive the heads of nipples and position the nipples out of contact with each other, and a foraminous closure engageable with the rim member of the device, said closure providing another face for the device, said other face being spaced from said first face a distance slightly in excess of the height of the nipples whereby when said closure engages said rim member said closure prevents the heads of the nipples from being withdrawn from between said protuberances.

4,512,490

STRENGTHENED CAN BODIES OF THIN-WALLED METAL

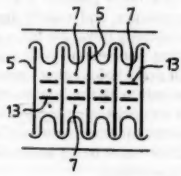
Siegfried Frei, St. Gallen, and Jakob Koch, Hünibach, both of Switzerland, assignors to Cantec, Inc., Forth Worth, Tex. and Gebrueder Hoffmann AG, Thun, Switzerland, a part interest

Filed May 3, 1982, Ser. No. 374,146

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118781

Int. Cl.[3] **B65D** *8/08, 8/12*

U.S. Cl. 220—72 **7 Claims**



1. A can body formed of a thin-walled metallic material, comprising:

said can body being provided with beads extending essentially in axial direction and in circumferential direction for the purpose of increasing the strength of the can body;

said beads comprising primary beads extending in a first predetermined direction and auxiliary beads extending in a second predetermined direction essentially at right angles to said primary beads;

said primary beads being continuous in said first predetermined direction with a substantially constant depth in the same radial direction and being arranged in a spaced relationship with respect to said second predetermined direction;

a plurality of protuberances;

said plurality of protuberances extending all in the same radial direction in the opposite radial direction of said primary beads;

said plurality of protuberances defining rows of protuberances with each said row extending in said first predetermined direction along with said primary beads between two adjacent primary beads;

each said auxiliary bead which extends in said second predetermined direction being located between two adjacent protuberances of a related row of protuberances; and

said auxiliary beads extend in one of the two radial directions and to a lesser depth than said primary beads.

4,512,491

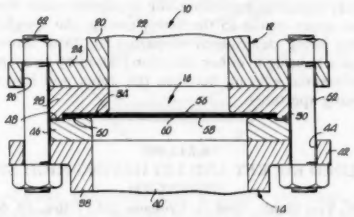
DUAL RANGE RUPTURE DISC ASSEMBLY

Robert L. DeGood, Lee's Summit, and Eddie R. Malcolm, Independence, both of Mo., assignors to Fike Metal Products Corporation, Blue Springs, Mo.

Filed Jan. 16, 1984, Ser. No. 570,985

Int. Cl.[3] **B65B** *25/00*

U.S. Cl. 220—89 A **7 Claims**



1. A pressure relief assembly comprising:

elongated support structure including means defining a bore therethrough of desired cross-sectional configuration, and flange means extending into said bore presenting a peripheral abutment face;

bidirectional relief means for normally preventing fluid flow through said bore, and for bursting in the event of a pressure differential thereacross of preselected magnitude, said relief means including a frangible element having first inner unsupported line of weakness defining an inboard burst pattern and a second distinct, separately operable outboard line of weakness presenting an outboard burst pattern, said first burst pattern being located closer to the center of said element than said second burst pattern; and

means for mounting said element across said bore in normal flow blocking relationship thereto, with the outer periphery of said element, and the entirety of said second outboard line of weakness defining the outer burst pattern being adjacent to and supported against movement in one direction by said flange abutment face.

4,512,492

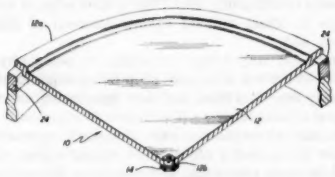
MANHOLE CLOSURE WITH A SINGLE LIQUID IMPERVIOUS, TWO-WAY GAS PRESSURE RELIEF VALVE

Walter C. Graybeal, 6791 Sheridan St., Hollywood, Fla. 33024

Filed Dec. 12, 1983, Ser. No. 560,382

Int. Cl.[3] **B65D** *51/16*

U.S. Cl. 220—204 **5 Claims**



1. A manhole closure to prevent surface liquids from entering a sewer system comprising:

a water impervious barrier, said barrier including a lip disposed circumferentially for supporting the closure around the perimeter of the manhole opening and an aperture;

a pneumatic, bidirectional pressure relief valve mounted within said barrier aperture, said valve having an upper casing and a lower casing joined together to form a valve housing, said upper casing having at least one aperture, and said lower casing having at least first and second

apertures; said valve further including a single moveable plug having a predetermined sealing weight mounted in said valve housing, said plug having a body and a guide stem, said stem being disposed in said first aperture of said lower casing, said plug having a cylindrical body with a closed end face, the inside closed end face being coupled to one end of the stem; and

a water sealing gasket mounted on the upper surface of the lower casing encircling said first and second apertures on said lower casing, the open end face surface of the plug body engaging the sealing ring to prevent water flow from the upper casing to the lower casing, the weight of the plug being determined to permit air flow through the valve housing in either direction caused by an air pressure differential existing between the upper and lower valve casing apertures.

4,512,493

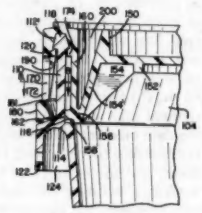
MOLDED BUCKET AND LID HAVING HIGH STACK STRENGTH

John W. Von Holdt, 7340 N. Croname Rd., Niles, Ill. 60648

Continuation-in-part of Ser. No. 356,496, Mar. 9, 1982, Pat. No. 4,420,093, which is a continuation-in-part of Ser. No. 319,933, Nov. 10, 1981, Pat. No. 4,452,382, and Ser. No. 329,258, Dec. 10, 1981, Pat. No. 4,380,305. This application Aug. 1, 1983, Ser. No. 519,253

Int. Cl.³ B65D *41/16, 41/18*

U.S. Cl. 220—306 **9 Claims**



1. A lid for removable attachment to a molded bucket comprising:

said lid defining a peripheral, annular recess adapted to receive the annular projection of a bucket in locking relationship;

said annular recess being formed by an internal annular portion and an external skirt portion lying in radial spaced relation thereto, said recess and skirt portion being joined by an intermediate portion defining said recess;

said skirt portion having a lower detachable strip extending generally continuously about the bottom edge of said skirt portion to retain said lid against removal of said skirt portion; and

said detachable strip being removable by being physically severed at a break area, said strip being capable of being manually detached from said skirt upon being severed for removal of said lid;

wherein said lid includes a pair of spaced, approximately annular walls, and a plurality of strengthening ribs disposed between said walls, said ribs being disposed diagonally to form side-by-side V-shaped formations.

4,512,494

PLASTIC CONTAINER HAVING TONGUE AND GROOVE RETENTION

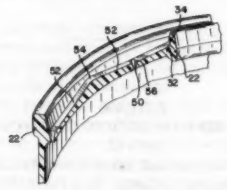
John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Feb. 28, 1983, Ser. No. 470,555

Int. Cl.³ B65D *55/16*

U.S. Cl. 220—307 **4 Claims**

1. A plastic container and removable interlocking lid comprising, in combination, a container body having a circular cross-section and having a bottom wall and an open top, said top of said container body comprising a generally U-shaped annular rim defining an upwardly facing trough, said U-shaped annular rim including an outer upright annular flange, an inner upright annular flange spaced radially inwardly from said outer flange, and a bottom wall, said outer and inner annular flanges and said bottom wall defining said upwardly facing annular trough, at least one of said outer and inner annular flanges having an annular groove formed on the wall facing said trough, said groove being defined at its upper end by a substantially flat annular surface inclined at an angle of from 0 degrees to 48 degrees from the horizontal, and said lid comprising a first radially outer depending wall dimensioned to fit and lock within said trough between said first and second annular flanges, said first depending wall having an annular substantially flat shoulder inclined at an angle to the horizontal substantially matching the angle of said flat annular surface defining said groove so as to engage against said flat annular surface thereby releasably locking said lid to the top of said container, a second depending annular wall on said lid positioned to contact and seal against the radially inner surface of said inner annular flange when said lid is pressed into locking relation with said top of said container, and a third depending annular wall on said lid spaced radially inwardly from said second wall and integrally connecting said second wall with a top surface of said lid, a plurality of drain holes being formed in the base of said trough to communicate with the interior of said container, the base of said trough comprising a plurality of abutting sloping surfaces forming circumferentially alternating apexes and lower portions, said drain holes being located adjacent lower portions of said sloping surfaces.



4,512,495

SAUCEPAN LID WITH DETACHABLE HANDLE

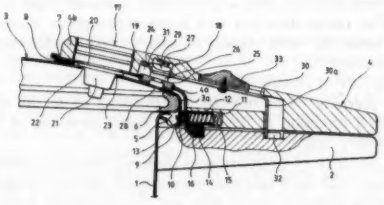
Ewald Bauer, Geislingen, and Jürgen Krejza, Kuchen, both of Fed. Rep. of Germany, assignors to Wurttembergische Metallwarenfabrik AG., Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 600,186

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314346

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—316 **14 Claims**



1. A saucepan lid having a handle detachably secured thereto, particularly for a pressure cooker, including monitoring elements sealingly mounted within the lid handle, characterized in that said lid handle (4) and said lid (3) are provided with projections (8; 35) and engagement recesses (7; 7')

adapted to be brought into mutual engagement for securing said lid handle and to be released from one another for detaching said lid handle, at least one projection (13) forming a movable component of a locking closure means (9).

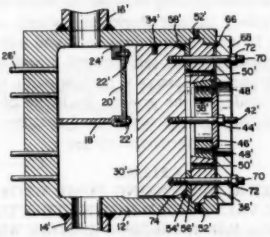
4,512,496
HIGH PRESSURE FEEDWATER HEATER CLOSURE ASSEMBLY

John L. Tsou, Berlin, Wis., assignor to McQuay, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 531,907, Sep. 12, 1983, Pat. No. 4,470,516. This application Aug. 2, 1984, Ser. No. 636,911

Int. Cl.³ B65D *45/32*

U.S. Cl. 220—319 **11 Claims**



1. In a pressure vessel having open and closed ends, a closure assembly comprising:

a generally cylindrical cover adapted for axial receipt in the open end of the pressure vessel;

means including a holding ring over the open end of the pressure vessel, defining a releasable retainer for constraining said cover against axial movement outward from the pressure vessel;

an o-ring seated in a predetermined chamfered groove formed in the outside edge of the end of said cover adjacent said retainer means; and

a compression ring disposed between said cover and retainer means, said compression ring overlying said o-ring and a predetermined portion of said cover so that part of the force exerted upon pressurizing the vessel is transferred directly to said retainer means through said compression ring without undue deformation of said o-ring.

4,512,497
COVERED DISH WITH ADJUSTABLE OPENING

Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Northbrook, Ill.

Continuation of Ser. No. 386,385, Jun. 8, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,778

Int. Cl.³ A47J *27/00*; B65D *51/16, 51/24*

U.S. Cl. 220—369 **6 Claims**

1. An apparatus for cooking, serving and storing food and the like, comprising:

a dish having a bottom wall and a side wall extending upwardly therefrom forming an open mouth;

a cover having an outer rim with an upwardly facing opening therein;

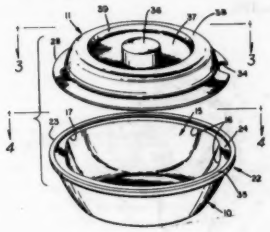
said open mouth having four outwardly arcuate sides interconnected by four corners to define an edge;

a dish rim extending outwardly from said edge;

said dish rim having an upwardly facing ledge thereon with a relatively wide portion positioned adjacent each of said sides and a relatively narrow portion positioned adjacent each of said corners;

said upwardly facing ledge and said upwardly facing opening cooperating to define an effective unblocked area at various positions of said cover on said ledge;

said cover being rotatable on said upwardly facing ledge between a position over one of said relatively narrow portions wherein the effective unblocked area of said upwardly facing opening is maximized and a position over one of said relatively wide portions wherein said upwardly facing opening is completely blocked; and



said effective unblocked area gradually decreases as the upwardly facing opening is rotated from a position over said relatively narrow ledge portion to a position over said relatively wide ledge portion.

4,512,498
STERILIZABLE CONTAINER

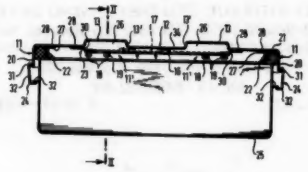
Karl Leibinger, Mühlheim, Fed. Rep. of Germany, assignor to Karl Liebinger Medizintechnik GmbH & Co., Muhlheim, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 614,109

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338371

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—371 **18 Claims**

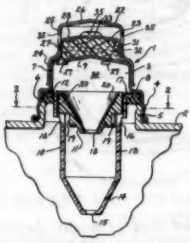


1. A sterilising container comprising a container part which is open at the top and a cover which has no openings and which is sealingly mounted on the container via a ring seal, the cover having a peripheral downwardly extending edge and at least one bulge which extends up to the edge and which forms a free flow passage from the atmosphere up to a filter or valve arrangement provided at the inner side of the cover and arranged between the internal chamber and the flow channel, characterised in that the ring seal (11)is arranged at the inner side of the cover (12) in the corner between the cover surface and the edge (20), bridges the bulge (13) and is spaced therefrom; and in that the filter and valve arrangement extends in a surface region which is bounded by the seal part (11') which bridges the bulge (13) and by the edges (13') of the bulge (13) which extend within the ring seal (11), whereby the part of the surface region which is not taken up by the filter or valve arrangement is covered in gas-tight manner.

4,512,499
GAS CAP ASSEMBLY

Arvo F. Uuskallio, Hartland, Wis., assignor to Briggs & Stratton Corp., Wauwatosa, Wis.

Filed Jul. 2, 1984, Ser. No. 627,116
Int. Cl.[3] B65D *41/04*
U.S. Cl. 220—374 15 Claims

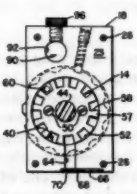


1. A cap assembly to enclose an opening in a fuel tank, comprising a generally cup-shaped cap, a tubular member connected to the cap and extending downwardly from the cap, the lower end of the tubular member having a drain opening, port means in the upper end portion of said tubular member, a generally conical member disposed in the upper end of the tubular member and having a second opening in the lower end providing communication between the interior of the tubular member and the interior of said cap, swirling means disposed on the outer surface of the conical member in alignment with said port means for causing liquid fuel and vapor entering said port means to swirl within said tubular member, said swirling aiding in separating said liquid from said vapor with the liquid flowing downwardly through said drain opening and said vapor passing upwardly through said second opening to the interior of said cap, a dome connected to said cap and spaced upwardly from said cap, said cap having an aperture providing communication between the interior of the cap and the space between the cap and said dome, and outlet means disposed in the side portion of said dome to discharge vapor and any remaining liquid from said space.

4,512,500
TABLET STORAGE AND DISPENSING DEVICE

Chesley E. Belbin, Sr., P.O. Box 490, Bay Roberts, Newfoundland, Canada A0A 1G0

Filed Dec. 9, 1982, Ser. No. 448,251
Int. Cl.[3] B65D *83/04*
U.S. Cl. 221—82 12 Claims

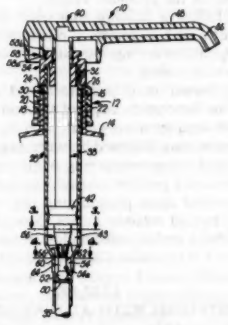


1. A pocket-sized tablet storage and dispensing device comprising a casing having a chamber defined by first and second, spaced apart wall portions and first and second apertures opening into said chamber and also opening exteriorly of said casing, a manually manipulated control wheel in the interior of said casing between said spaced apart wall portions, said control wheel having shaft means rotatably supporting said wheel from both of said spaced apart wall portions and having a portion received in said chamber, said control wheel also extending through said first aperture from said chamber to the exterior of said casing such that a peripheral portion thereof lies exteriorly of said casing to enable said control wheel to be manually rotated by the user, a tablet dispensing wheel disposed entirely within said chamber and formed along its outer periphery with a plurality of circumferentially spaced, radially outwardly opening, tablet-receiving recesses each sized to receive and store a single tablet, said dispensing wheel being axially aligned with said control wheel, and said dispensing wheel being rigid with and rotatable with said control wheel, said casing being formed with an internal wall further delimiting said chamber and peripherally surrounding said dispensing wheel, the clearance between said wall and the outer periphery of said dispensing wheel being large enough to permit rotation of said dispensing wheel but small enough to prevent tablets stored in said recesses entering the space between said wall and the outer periphery of said dispensing wheel, said second aperture being formed through said wall, and said dispensing wheel being rotatable with said control wheel to positions where said recesses successively register with said second aperture to provide for the gravity discharge of the stored tablets one at a time through said second aperture.

4,512,501
DOWN-LOCKING DISPENSING PUMP WITH GUIDED CHECK VALVE HOLD-DOWN STRUCTURE

Donald D. Foster, R.R. 1, Box 306A, Kingsville, Mo. 64051

Filed Aug. 23, 1982, Ser. No. 410,459
Int. Cl.[3] B65D *47/34*
U.S. Cl. 222—153 4 Claims



1. In a dispensing pump, the improvement comprising:
a tubular body having a collar at one end thereof and an inlet at the opposite end thereof;
a tubular projecting through said collar and reciprocable within said body between depressed and extended positions;
a check valve operably associated with said inlet for opening and closing the same,
said valve opening the inlet during movement of the plunger toward said extended position for drawing products into the body through said inlet and closing the inlet during movement of the plunger toward said depressed position for forcing products out of the body through said plunger;
locking means associated with said collar for selectively, releasably locking the plunger in said fully depressed position;
an elongated, lowermost tip on said plunger disposed for engaging said valve and holding the same in its position closing said inlet when the plunger is locked by said locking means in said fully depressed position;
orifice means in said plunger communicating the interior of the latter with the interior of said body for discharging

products through the plunger upon depression of the latter,

said orifice means including a series of axially elongated orifices spaced around said tip and separated by a plurality of elongated, yieldably resilient legs; and

guide means in said body disposed to cooperate with said plunger tip in maintaining the same engaged with said valve when the plunger is locked in said fully depressed position,

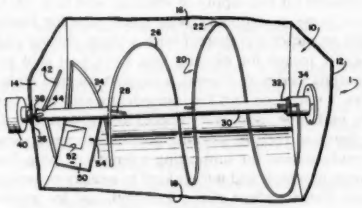
said locking means including structure lockingly engageable to retain the plunger in its fully depressed position upon slight rotation of the plunger relative to the collar when the plunger is fully depressed with said tip engaging the valve and said guide means engaging said tip for resisting rotation thereof with the remainder of the plunger, whereby to torsionally load said legs.

4,512,502

ICE DISPENSING METHOD AND APPARATUS

Jerry L. Landers, Sellersburg, Ind., assignor to SerVend International, Inc., Sellersburg, Ind.

Filed Mar. 30, 1982, Ser. No. 363,370
Int. Cl.³ G01F *11/20*
U.S. Cl. 222—413 **5 Claims**



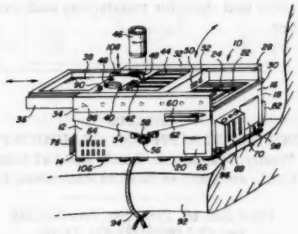
1. An ice dispensing apparatus comprising a horizontally oriented bin having end walls, side walls and a bottom wall, an ice dispensing opening in one of the walls, and a cone-shaped wire auger mounted between end walls for agitating the ice in the bin and for pushing ice along the bottom of the bin axially toward the opening, while eliminating crushing of the ice, said bin being semicircular in shape, wherein the end walls are substantially semicircular and wherein the side and bottom walls are substantially smoothly curved in semicylindrical shape, the cone-shaped wire auger having a large flyte near one end wall of the bin and having a smaller flyte near an opposite end wall of the bin, the cone-shaped wire auger being mounted on an eccentrically positioned axle which extends from one end wall to the opposite end wall, the axle sloping downward from the end wall opposite the opening to the end wall adjacent the opening and extending into a bearing in one of the side walls and extending through a seal in the other of the side walls, and a driving means connected to the axle adjacent the seal on a side thereof opposite the bin, a few substantially radial connectors mounted in the axle and extending outward therefrom and connected to portions of the auger for mounting the auger on the axle, the connectors being non-perpendicular to the auger axle, generally radially extending fingers mounted on the axle near a lower end thereof for breaking ice clusters near the fingers, the fingers being angled slightly toward the axle, the fingers being inclined from radial directions at an angle toward the axle, and the opening being positioned beneath the fingers, whereby as the axle turns, distal ends of the fingers sweep adjacent the opening, and an opening plate secured to a bottom wall of the bin adjacent a side wall thereof and wherein the opening plate is removable and replaceable with a plate having an opening of a different size to control flow of ice from the bin according to selected size of the opening in the selected plate.

4,512,503

ALL PURPOSE VEHICLE TRAVEL ORGANIZER

John Gioso, 1908-B Soho Pl., Coram, N.Y. 11727

Filed Jul. 9, 1984, Ser. No. 629,273
Int. Cl.³ B60R *7/00, 7/04;* B65D *85/00*
U.S. Cl. 224—42.42 R **14 Claims**



1. An all purpose vehicle travel, comprising in combination:

(a) a base in the shape of a rectangular parallelepiped with rigid bottom panel, rigid front panel, rigid rear panel, two rigid side panels and an open top; wherein said base is of such dimension as to fit on the upper surface of a vehicle seat;

(b) a fixed rectangular tray which nests into said open top such that the top of said fixed rectangular tray is flush with the top of said open top;

(c) a rectangular hinged track lid together with associated hinge, wherein said rectangular hinged track lid has the same rectangular base dimension as said open top and wherein said hinged track lid has two vertical planar extensions extending the entire length of said front and said rear panels; wherein each of said vertical planar extensions has a perpendicular extension directed inwards, thereby forming a lengthwise track with overhang;

(d) a sliding tray whose travel is defined by said lengthwise track with overhang; and

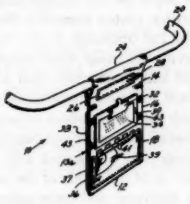
(e) means for locking and unlocking said sliding tray so as to provide access to said fixed tray and to secure offset position of said sliding tray.

4,512,504

SHOPPING ORGANIZER

Lois Owlett, 734 Maple Ridge Rd., Milford, Ohio 45150

Filed Dec. 19, 1983, Ser. No. 563,069
Int. Cl.³ B60R *11/00*
U.S. Cl. 224—42.46 R **8 Claims**



1. A shopping organizer for mounting to the handle of a shopping cart, comprising:

a sheet having front and back sides, said sheet being foldable into sections, said sections being unfolded for mounting said sheet to said handle;

a sleeve mounted to one of said sections and being adapted to hold a pen or pencil;

a plate mounted to another of said sections;

at least one pocket mounted to another of said sections;

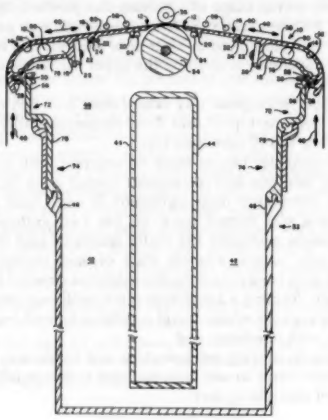
a flap attaching to said sheet, said flap being foldable in one direction around said handle with said sections unfolded, said flap thereafter being secured to said sheet for mounting said sheet to said handle so that said sections extend vertically downwardly from said handle, said flap being foldable in the opposite direction about said sections with said sections folded together, said flap thereafter being secured to said sheet for maintaining said sections folded together.

4,512,505

CONVERTIBLE PLATEN FOR GRAPHICS PLOTTER

Pernie E. Westly, Huntington Beach, and Uri Leder, Cerritos, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 16, 1984, Ser. No. 631,289
Int. Cl.³ B65H *23/00, 23/04*
U.S. Cl. 226—101 **2 Claims**



1. In a graphics plotter having a drum disposed between and in parallel spaced relationship with a pair of paper holding rollers and including a pair of paper loop vacuum columns disposed with respective rectangular openings between respective ones of the rollers and the drum and parallel thereto, the improvement to permit operation of the plotter as either a roll paper plotter or a cut paper plotter comprising:

(a) a pair of convertible platen members disposed adjacent respective ones of the openings to the vacuum column, said members having an inner edge adapted to fit close adjacent the drum and an arcuate outer edge, said members being mounted for movement between a raised cut paper position with said inner edges adjacent a drum and said members between said inner and outer edges spanning across the openings and a lowered roll paper position lying adjacent the top of the inside of the outer wall of the vacuum columns whereby said outer edges form curved surfaces at the top outer edges of the vacuum columns over which roll paper can smoothly slide between the vacuum columns and the paper holding rollers when said members are in said lowered position and form a table on either side of the drum with curved outer edges over which cut paper can smoothly slide back and forth when in said raised position; and,

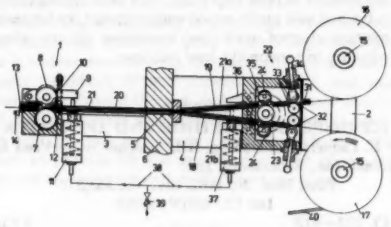
(b) support means for releasably holding said members in said position.

4,512,506

SYSTEM FOR THE SUPPLY OF STAPLE WIRE TO A STAPLER

Emil Fischer, Ludwigshafen-Oggersheim, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,786
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210014
Int. Cl.³ B27F *7/21*
U.S. Cl. 227—5 **18 Claims**



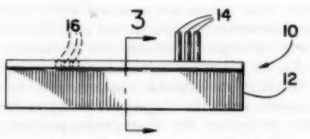
1. An apparatus for the supply of stapling wire to a stapler, comprising a frame, a stationary wire guide pipe for feeding wire through an outlet end thereof with a sharp cutting edge, a moving knife, means for moving said knife past said pipe outlet and cutting said wire thereat, a support for two reels of stapling wire, a wire feed unit for transporting said wire from said reel to said pipe, said reel support being designed for supporting two said reels in working positions thereof, means forming a ready station for supporting a length or wire from one of the reels in which said wire is kept in a ready or waiting position some distance short of the feed unit, and for guiding wire from the other of said reels to said feed unit, a change-over unit placed between the reels and the feed unit, said change-over unit having two wire driving parts designed to be moved in opposite directions and having one of said wires from said reels running through them, said change-over unit's wire driving parts being able to take effect on the wire going therethrough, and means for changing over the direction of motion of the two wire driving parts when the reels are to be changed over and wire supplied to the guide pipe in place of wire from the other reel.

4,512,507

DEVICE FOR JOINING ELECTRONIC TRANSMISSION WIRE TO ELECTRONIC CONNECTORS

Walter L. Ledin, 4904 Arbor Rd., Long Beach, Calif. 90808

Filed Sep. 2, 1982, Ser. No. 414,295
Int. Cl.³ B23K *3/00*
U.S. Cl. 228—57 **3 Claims**



1. A device for simultaneously joining electrical wire to a male connector on one end and to a female connector on the other end of a electronic transmission cable comprising:

a fixture having a (sheet) metal plate (base) with a plurality

of pins on one end adapted to accept said female connector and a plurality of apertures extending through said metal plate on the opposite end adapted to accept said male connector.

4,512,508

METHOD AND APPARATUS FOR THE MACHINE SOLDERING OF WORKPIECES

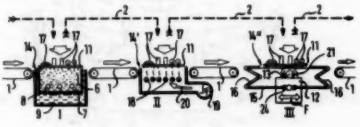
Heino Pachschwöll, Twistetal-Nieder-Waroldern, Fed. Rep. of Germany, assignor to Zevatron GmbH, Gesellschaft fur Fertigungseinrichtungen der Elektronik, Arolsen, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 360,955

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111809

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—180.1 **12 Claims**



1. A method for the automatic machine soldering of workpieces in an apparatus having a plurality of treatment stations including at least a fluxing station, a heating station and a soldering station, and means for transferring said workpieces from one of said treatment stations to an adjacent one of said treatment stations, the method comprising the steps of:

(a) transferring a said workpiece into a first fixed position above said fluxing station;

(b) fluxing while holding said workpiece independent of any movement of said transferring means;

(c) transferring said workpiece from a second fixed position above said fluxing station to a third fixed position above said heating station;

(d) heating said workpiece independent of any movement of said transferring means;

(e) transferring said workpiece from a fourth fixed position above said heating station to a fifth fixed position above said soldering station;

(f) soldering said workpiece while pivoting said workpiece about a substantially horizontal axis to produce relative movement between said workpiece and a crest of a solder wave, said crest of said solderf wave being moved relative to said workpiece along a lower surface thereof, said solder step being independent of any movement of said workpiece during said transferring steps.

4,512,509

TECHNIQUE FOR BONDING A CHIP CARRIER TO A METALLIZED SUBSTRATE

Roland Ellis, Jr., Burlington Township, Burlington County; Brian E. Jacobs, Collingswood Township, Camden County, both of N.J.; Edward J. March, Lower Makefield Township, Bucks County, Pa., and Raymond J. Newman, Lawrence Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Feb. 25, 1983, Ser. No. 469,662

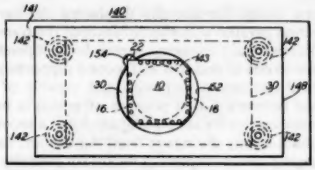
Int. Cl.³ B23K *31/02*; B01J *17/00*

U.S. Cl. 228—180.2 **2 Claims**

1. A method of bonding leads of a substantially square chip carrier to respective bonding pads on a planar metallized substrate, a predeposited reflowable bonding material being interposed between the pads and leads; the method comprising the steps of:

roughly aligning the chip carrier leads to the respective bonding pads on a first major surface of the planar substrate;

loosely capturing a corner of the chip carrier in a notch of a circular aperture in a template overlying the substrate;



reflowing the bonding material to self align the leads to the pads by permitting free rotation of the chip carrier about the loosely captured corner; and

solidifying the material to form the bond.

4,512,510

PRINTED CIRCUIT BOARD SOLDERING APPARATUS

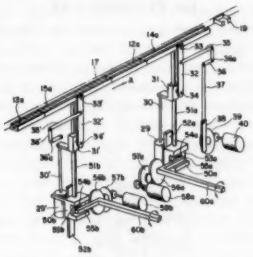
Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Nitsu Keiki Co. Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,984

Claims priority, application Japan, Oct. 26, 1982, 57-186682; Oct. 26, 1982, 57-186681; Oct. 26, 1982, 57-186680

Int. Cl.³ H05K *3/34*

U.S. Cl. 228—40 **7 Claims**



1. An apparatus for soldering printed circuit board, comprising:

a carrier adapted to support a printed circuit board;

means for moving the carrier along a predetermined transfer path;

first front and rear wheel members mounted at one side of the carrier;

second front and rear wheel members mounted at the other side of the carrier;

first and second vertically moveable supporting means;

a pair of transversely spaced parallel first and second front rails supported on said first supporting means for vertical movement therewith and defining part of said transfer path;

a pair of transversely spaced parallel first and second rear rails supported on said second supporting means for vertical movement therewith and defining part of said transfer path;

said first front and rear rails and said second front and rear rails being adapted for supporting engagement with said first front and rear wheel members and said second front and rear wheel members, respectively, and being positioned so that said first front and rear wheel members and said second front and rear wheel members can position on said first front and rear rails and said second front and rear rails, respectively, at the same time;

a molten solder vessel located beneath the space between said first and second front and rear rails;

first and second drive means for vertically moving said first and second supporting means so that said front and rear rails may be vertically moved independently from each other;

engaging means for laterally displacing the carrier in the direction parallel with the direction of the transfer path of the carrier, said engaging means being operatively connected to one of said first and second supporting means for vertical movement therewith and capable of being displaced between a first position at which it may engage with the carrier for supporting same and a second position at which it may disengage from the carrier; and

an engaging means-displacing means for laterally displacing the said engaging means in the direction parallel with the direction of the transfer path of the carrier,

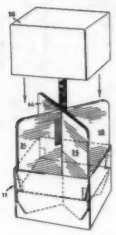
whereby said first and second front and rear rails lower upon actuation of said first and second drive means to bring the printed circuit board carried on the carrier on said rails into contact with the molten solder, and said engaging means positioning at said first position displaces for moving the printed circuit board in the direction parallel with the transfer path of the carrier.

4,512,511

DIVIDED DISPLAY CONTAINER

John Zimmermann, Scarborough, Canada, assignor to Somerville Belkin Industries Limited, London, Canada

Continuation of Ser. No. 370,105, Mar. 20, 1982,. This application Dec. 28, 1983, Ser. No. 566,338
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—15 **2 Claims**



1. A paperboard container and divider comprising:

a container base having a bottom and four side walls which intersect in upstanding corners each disposed at right angles to the bottom;

a divider having four divider panels each radiating from a common central axis extending normal to the center of said bottom and each panel having a free side edge that extends upright parallel to said axis within a corner formed by two of said side walls of said base and extends beyond said base;

a cover for said base operative to close the container and having a top which in closed position lies parallel to said bottom, and the cover having four side walls each at right angles to the top, the cross section of said cover taken normal to said axis being the same as the cross section of said base, and the corners formed by the four side walls of both the base and the cover being everywhere mutually parallel and parallel with said axis;

locking means located internally of the base and cooperating with catch means on the free side edges of the divider to maintain the divider fixed within the base; and

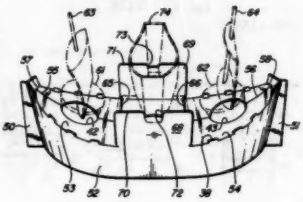
each of said upright free side edges of said divider panels extending in a straight line above the side walls of said base to a height equal to the height of the side walls of said cover, whereby the free side edges of the divider fit into the corners of the cover and form a cover guide as the cover is slidingly telescoped over the divider to said closed position wherein the free lower edges of the side walls of the cover abutt the free upper edges of the side walls of the base.

4,512,512

FAST FOOD SERVING TRAY

James W. Fleming, Vancouver, Canada, assignor to Lawson & Jones Limited, Mississauga, Canada

Filed Jan. 10, 1984, Ser. No. 569,770
Int. Cl.³ B65D *5/36*
U.S. Cl. 229—30 **16 Claims**



10. A serving tray for fast food or the like, comprising, in combination,

(a) a pair of generally upright, outwardly convexly curved side walls connected with each other at connection tabs integral with the respective side walls and end sections thereof;

(b) said side walls being further integral with a pair of transverse top walls, each top wall having a parabolic contour in plan, said top walls being disposed one at each end of the tray;

(c) each top wall having a generally circular cutout formed centrally thereof, said generally circular cutouts being of the size adapted to removably receive a frustoconical container such as a plastic coffee cup;

(d) said top walls having inside end edges defining two opposed ends of a central opening adapted to receive a rectangular container such as a hamburger or fish tray, the two remaining opposed sides of said central opening being formed by a pair of normally upwardly extending generally rentangular side panel sections, each side panel section being integral with one of said side walls and forming a central, upward extension of the surface thereof;

(e) each of said side panel sections having a normally generally horizontal top edge, the top edges being generally coincident with a horizontal plane spaced above the said inside end edges, said top edges being adapted to support a container such as a French fry container of a generally oval contour in plan.

4,512,513

ARC METAL SPRAY APPARATUS AND METHOD

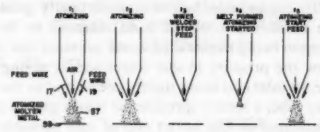
Frank S. Rogers, 4955 NW. Gustafson Rd., Silverdale, Wash. 98383

Filed Oct. 18, 1982, Ser. No. 435,022
Int. Cl.³ B05B *7/18, 7/22*
U.S. Cl. 239—8 **12 Claims**

12. An arc spray method as recited in claim 7 wherein steps (f) and (g) comprise:

(f) sensing the occurrence of an increase above a predetermined value of the current of said electrical power; and

(g) stopping the feeding of said first and second wires when said current is above said predetermined value and start-



(FIG _ 1 SYSTEM)

ing the feeding of said first and second wires when said voltage is at or below said predetermined value.

4,512,514

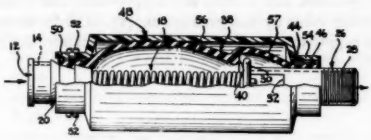
FLUID PULSATION APPARATUS

Teleb M. Elcott, 3809 Vista Linda Dr., Encino, Calif. 91316

Filed Oct. 7, 1983, Ser. No. 540,012

Int. Cl.³ B05B *1/08*

U.S. Cl. 239—99 **8 Claims**



1. Fluid pulsation apparatus having a fluid inlet and outlet for converting a continuous stream of fluid flowing under pressure into the inlet into a pulsating stream exiting from the outlet, comprising:

a generally tubular elastomeric sleeve having upstream and downstream ends which communicate, respectively, with the apparatus inlet and outlet and which is designed to expand circumferentially in response to internal pressure generated by the inlet fluid stream;

a generally tubular rigid housing surrounding the elastomeric sleeve and designed to restrict its circumferential expansion to a predetermined expansion limit;

fluid barrier means located within the elastomeric sleeve for blocking fluid flow through that sleeve to the outlet when the barrier means is held in an upstream closed position; and

bias means positioned between the inlet and the barrier means for biasing the barrier means in its closed position in opposition to an internal fluid pressure generated within the elastomeric sleeve between its upstream end and the barrier means by the inlet fluid stream, the bias means selected to allow the barrier means to open when the internal fluid pressure reaches a first level which is sufficient to cause the elastomeric sleeve to expand circumferentially to the predetermined expansion limit, but is less than the static pressure of the inlet fluid, where the barrier means remains open until the internal fluid pressure drops to a second level less than the first level, and where the flow of fluid downstream of the barrier means is sufficiently unrestricted to permit the internal fluid pressure to drop below the second level when the barrier means is open, whereby the barrier means is caused to sequentially open and close, generating the pulsating fluid stream at the outlet of the apparatus.

4,512,515

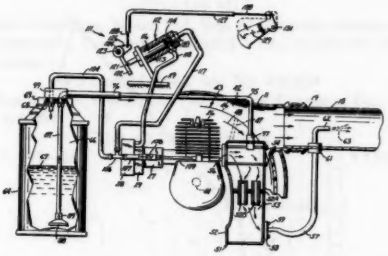
THERMAL FOG GENERATOR

William L. Tenney, Crystal Bay, Minn., assignor to London Fog, Inc., Long Lake, Minn.

Filed Jun. 9, 1983, Ser. No. 502,505

Int. Cl.³ A01M *7/00*

U.S. Cl. 239—129 **56 Claims**



1. An apparatus for producing and dispensing fog, smoke, mist, and the like, comprising: a housing having a chamber, an air inlet opening allowing air to flow into the chamber, and tube means having an air discharge passage open to the chamber to carry air from the chamber to the atmosphere, an internal combustion engine mounted on the housing operable to produce hot exhaust gas and a supply of crankcase gases under pressure, blower means located in the chamber drivably connected to the engine operable to load the engine and move air through the chamber and air discharge passage and dispense air into the atmosphere, means for carrying the hot exhaust gas from the engine to the tube means and discharging said hot exhaust gas into the air discharge passage, container means for storing a liquid formulation, means mounting the container means on the housing, line means for carrying the liquid formulation from the container means to the means for carrying the hot exhaust gas, and control means for selectively supplying said crankcase gases under pressure from said engine to said container means, said crankcase gases under pressure in the container means forcing said liquid formulation from said container means and through said line means into the means for carrying the hot exhaust gas, the velocity of said exhaust gas atomizing said liquid formulation and the heat of said hot exhaust gas vaporizing at least part of said atomized liquid formulation, said atomized and vaporized liquid formulation being discharged into said air discharge passage, mixed with the air flowing in said passage, and dispensed into the atmosphere, said vaporized liquid formulation being condensed by the cool air forming a fog, smoke, or the like, said control means having means operable to vent the crankcase gases under pressure from the container means to reduce the pressure of the crankcase in the container means to terminate the flow of liquid formulation to the means for carrying the hot exhaust gas from the engine.

4,512,516

AGRICULTURAL SPRAYER

Patrick J. Ballu, Reims, France, assignor to Tecnoma, Epernay, France

Filed Jun. 25, 1982, Ser. No. 392,325

Claims priority, application France, Jun. 25, 1981, 81 12495

Int. Cl.³ B05B *1/20*

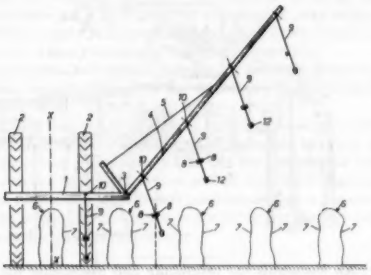
U.S. Cl. 239—168 **7 Claims**

1. An agricultural sprayer for discharging treating fluid onto the sides of plants, said sprayer comprising

a frame adapted to lie parallel to the ground, said frame including a wall,

a plurality of substantially rigid supports suspended from pivot points on said frame for free oscillation movement such that under the action of the weight thereof they can assume vertical positions between plants which are to be

treated with treating fluid regardless of the slope of the ground, said substantially rigid supports including portions which lie below said pivot points and are juxtaposed to said wall of said frame, each of said portions comprising a pad which is arcuate in shape and which has a radius of curvature centered at the pivot point on said frame to which the respective substantially rigid support is attached,



spray nozzles disposed on said supports for discharging treating fluid onto the sides of plants, and

catch means mounted on said frame so as to interfere with said substantially rigid supports and lock said substantially rigid supports in said vertical positions, said catch means including a push rod associated with each of said substantially rigid supports for pushing the arcuate-shaped pads thereof into locked positions against said wall of said frame.

4,512,517

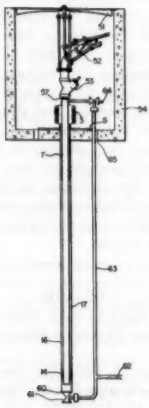
IRRIGATION APPARATUS RETRACTILE INTO PIT

Ron Manor, 29 Shimoni St., Tel Aviv, Israel

Filed Aug. 31, 1982, Ser. No. 413,420

Int. Cl.[3] B05B *15/10*

U.S. Cl. 239—206 **1 Claim**



1. Sprinkler irrigation apparatus adapted to be retracted into an open-top underground pit, to be raised out of the pit by water pressure, and to eject water only after having been elevated above the plants to be irrigated, the apparatus comprising:

a hydraulically operated vertical telescopic lifting unit consisting of an outer tube rigidly fastened in the bottom of said pit and having its bottom end connected to an underground water supply system, and an inner tube vertically movable in and along said outer tube, the respective upper ends of said tubes being tightly attached to the two ends of an axially expandable bellows; a vertically positioned pressure relief valve of the kind adapted to be wide opened upon being exposed to water pressure one or two bar below the pressure in said water supply acting on its inlet side, its inlet end being tightly connected to the top of said inner tube; a rotary sprinkler or water gun of known design mounted on the outlet end of said pressure relief valve, the diameter described by the rotating nozzle of said sprinkler being smaller than the inner contour of said pit; a flat cover positioned above said sprinkler of a dimension permitting its closing the top opening of said pit, said cover being attached to the top of said telescopic unit and being adapted to be raised above ground together with said sprinkler; a pressure-operated valve of the kind to be opened by pressure applied to its actuating mechanism, positioned between said outer tube and said underground water supply; a pressure operated drain valve adapted to be closed by pressure applied to its actuating mechanism connected at its one end to the portion of said inner tube, and at the other end to the atmosphere; a remote control station communicating with said pressure-operated supply valve and said pressure-operated drain valve through piping, said control station serving to open said supply valve and to close said drain valve by pressure supplied through said piping whenever the irrigation apparatus is to be operated, and to close said supply valve and to open said drain valve by non-pressure supply, in order to stop water supply to said sprinkler and to lower it into said pit.

4,512,518

ATOMIZING HEAD

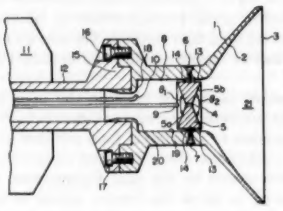
Yuzo Inukai, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 25, 1983, Ser. No. 545,295

Claims priority, application Japan, Oct. 25, 1982, 57-161411[U]

Int. Cl.[3] B05B *3/10*

U.S. Cl. 239—223 **9 Claims**



1. A rotary atomizing head for an atomizer comprising;

a cup-shaped rotary atomizing head body mounted at its rear end on the front end of a rotary shaft; said head body having a conical inner discharge surface with a circular outer edge; a cylindrical bell hub provided in said atomizing head body; discharging passages provided for guiding a liquid in the form of a film to the inner surface of said atomizing head body; and said bell hub having a liquid passage along the central axis thereof and conically recessed end faces.

4,512,519

SPRINKLER

Mordechay Uzrad, Hof Hacarmel, Israel, assignor to Mifalei Matechet Naan, Kibbutz Naan, Israel

Filed Oct. 5, 1982, Ser. No. 432,861

Int. Cl.³ B05B *3/16*

U.S. Cl. 239—381 **4 Claims**

4. A sprinkler comprising:

a water conduit which is connectable to a water feed line and supplies water to a nozzle;

a rotatable body, revolving about a vertical axis, being positioned above and eccentrically relative to said nozzle;

the rotatable body defining a central bore and two downwardly open curved slots extending from said central bore;

said slots defining oppositely curved arcs about the rotatable body;

means for seating the rotatable body in eccentric relation to the nozzle whereby said rotatable body oscillates back and forth when a water jet impinges eccentrically thereon.

4,512,520

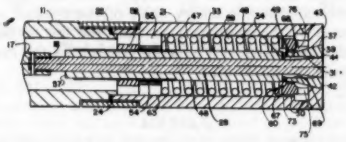
DUAL ELEMENT DESUPERHEATER APPARATUS

Kevin G. Schoonover, Tucker, Ga., assignor to Steam Systems and Services, Incorporated, Atlanta, Ga.

Filed May 11, 1983, Ser. No. 493,724

Int. Cl.³ A62C *31/00*

U.S. Cl. 239—440 **22 Claims**



1. Apparatus for introducing a variable flow of fluid into a body, comprising:

a housing having an injection region locatable in the body, and having an interior chamber operable to receive a supply of fluid;

a primary flow control element within said housing and selectably operaive to open a primary fluid flow orifice leading to said injection region;

a secondary flow control element within said housing concentric to said primary flow control element and selectably operative to open a secondary fluid flow orifice leading to said injection region; and

means associated with said secondary flow control element to operate said primary flow control element after said secondary fluid flow orifice is opened, and to block fluid flow through the opened secondary fluid flow orifice when said primary fluid flow orifice is open,

so that the fluid can flow only through said primary orifice when both said primary and second orifices are opened.

4,512,521

APPARATUS FOR GRANULATING AND CONVEYING CORN-COB MIX

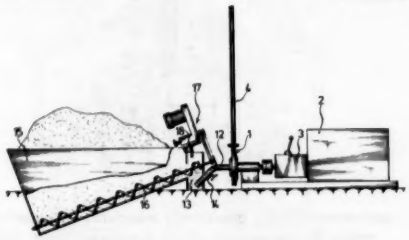
Hermann Johanning, Melle, Fed. Rep. of Germany, assignor to Engelbrecht & Lemmerbrock GmbH & Co., Melle, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,624

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149981

Int. Cl.³ B02C *13/286*

U.S. Cl. 241—34 **8 Claims**



1. Apparatus for granulating corn cob mix, and for conveying the granulate into a receptacle situated at a higher level than that of the apparatus, which comprises a beater mill comprising a casing divided by a sieve which determines fineness of the granulate, an integrated blower disposed in the casing behind the sieve, and a conveyor pipe tangentially connected to said blower, and directed into said receptacle, a suction pipe connected to the beater mill and provided with a secondary air opening, the aperture width thereof being adjustable, the width of said suction pipe being greater by 35 to 70% than the width of the conveyor pipe, a suction chamber disposed at a lower level than that of the beater mill for dipping thereinto said suction pipe, and conveyor means disposed in the suction chamber for feeding corn cob mix thereinto, so as to allow the corn cob mix to be sucked into the beater mill by means of said suction pipe.

4,512,522

SINGLE VERTICAL MOTION FEEDTUBE PROTECTOR AND ACTUATOR FOR A FOOD PROCESSOR

James E. Williams, Stanford, Conn., assignor to Cuisinarts, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 500,327, Jun. 2, 1983, abandoned. This application Oct. 17, 1983, Ser. No. 542,766

Int. Cl.³ B02C *25/00*

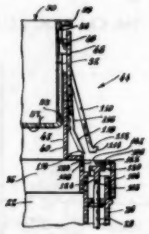
U.S. Cl. 241—37.5 **41 Claims**

1. In a food processor of the type including a housing containing an electric motor drive and control means for rendering said motor drive inoperative unless said control means is actuated, a bowl mountable on said housing for surrounding a rotary tool adapted to be driven by said electric motor drive and a removable cover for said bowl, a feedtube forming a passageway for feeding food items into said bowl with a feedtube protector including outer means positionable in a predetermined position relative to the feedtube carrying a food pusher captured in a telescoping relationship with respect to said outer means so that the pusher can be plunged longitudinally into said passageway for pushing food items toward the rotary tool in said bowl, said control means being actuated for rendering said motor drive operative when and only when said cover is properly positioned on said bowl and said outer means

of the feedtube protector is positioned in said predetermined position relative to said feedtube, feedtube protector actuating means comprising:

laterally extendible means operatively associated with said control means and operated by said outer means of said feedtube protector for causing actuation of said control means by a single downward vertical movement of said outer means into said predetermined position and for deactivation of said control means by an upward vertical movement of said outer means,

said laterally extendible means including a member pivotally mounted for rotational movement,



said member being operatively associated with said control means for transmission of the downward linear motion of said outer means into a rotational movement of said pivoted member thereby actuating said control means,

whereby a one-motion, vertical movement of the outer means of the feedtube into and away from said predetermined position relative to the feedtube controls the operation of the food processor, thereby permitting one-motion opening of the feedtube for convenient loading of the food processor.

4,512,523

APPARATUS FOR MINCING FROZEN MEAT INTO GROUND MEAT

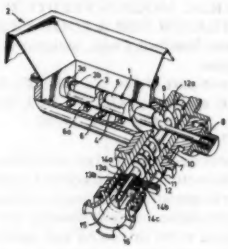
Tsuyoshi Higashimoto, Ikoma, Japan, assignor to Higashimoto Kikai Co., Ltd., Japan

Filed Jul. 18, 1983, Ser. No. 514,464

Claims priority, application Japan, Jul. 26, 1982, 57-114350[U]

Int. Cl.³ B02C *18/30*

U.S. Cl. 241—82.4 **6 Claims**



1. An apparatus for converting frozen meat into minced meat, said apparatus comprising:

(A) a hopper into which frozen meat is charged, said hopper having

(i) an open top,

(ii) a lower region,

(iii) the lower region being of elongated semi-cylindrical configuration, and

(iv) an outlet at one end of said lower region,

(B) a crusher roll rotatably mounted in said hopper, and constituting

(i) a rotary shaft and

(ii) a plurality of pawl-shaped feed vanes axially spaced along said shaft and extending radially therefrom,

(iii) each feed vane having a cutting edge for crushing frozen meat fed into the hopper,

(iv) said crusher roll being disposed with its rotary shaft extending coaxially of the longitudinal axis of the elongated semi-cylindrical lower region of the hopper,

(v) the feed vanes and cutting edges of the crusher roll being disposed transversely of the longitudinal axis of said lower region of the hopper,

(C) a plurality of stationary projections on the inner surface of said hopper, said projections being disposed between adjacent feed vanes for preventing idle rotation of frozen meat as it is crushed and for guiding the crushed frozen meat toward the outlet of the hopper,

(D) a pipe having an inlet communicating with the outlet of the hopper through which the meat crushed in the hopper is fed to the inlet to the pipe,

(E) a main roll rotatably mounted in said pipe, and having a rotary shaft and a main spiral feed vane formed on said rotary shaft,

(i) said pipe and main roll and rotary shaft being so disposed that the rotary shaft of the main roll crosses the rotary shaft of the crusher roll adjacent the outlet of the hopper,

(F) said rotary shaft of said crusher roll also having a spiral vane slightly projecting into said pipe to push crushed meat from the lower region of the hopper into the pipe,

(G) said rotary shaft of said main roll also having an auxiliary feed vane to advance crushed frozen meat fed into the spiral vane from the hopper toward the spiral vane on the rotary shaft of the main roll,

(H) said rotary shaft of the main roll further having cutter blades mounted thereon upstream of the spiral vane which turn with the main shaft,

(I) said pipe having plates stationarily mounted therein with said cutter blades interposed therebetween and with apertures therethrough for cooperation with said cutter blades to mince meat advanced therethrough by the main feed vane after having been crushed in the hopper and pushed from the hopper outlet into the pipe, and

(J) power means to turn said shafts simultaneously,

(K) whereby frozen meat charged into said hopper is crushed by the cutting edges of the crusher roll, pushed through the outlet of the hopper into said pipe by the spiral vane on the rotary shaft of the crusher roll, advanced by the auxiliary feed vane and fed to the cutter blades and plates at a mincing position by the main feed vane of the main roll.

4,512,524

CRUSHER FOR CONCRETE STRUCTURES

Akihiko Shigemizu, Tokyo, Japan, assignor to Takachiho Kogyo Yuugen Kaisha and Kabushiki Kaisha Kansai Kougu Seisakusho, both of Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,322

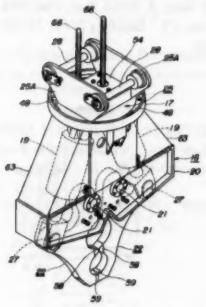
Claims priority, application Japan, Sep. 16, 1983, 58-170778

Int. Cl.³ B02C *1/06*

U.S. Cl. 241—101.7 **10 Claims**

1. In a crusher for concrete structures, including a head carried by a traveling carrier, a rotating base having an axis and supported by said head concentrically therewith for rotation relative thereto, a pair of hydraulic cylinders pivotally supported at one end by said rotating base and disposed symmetrically with respect to the axis thereof, a pair of jaw members pivotally supported by said rotating base and disposed symmetrically with respect to the axis thereof, and click-stop means provided between said rotating base and said head for retaining said rotating base in any one of a plurality of prede-

termined circumferential positions with respect to said head, against a value of load applied on at least one of said rotating base and the head below a predetermined value, the improvement comprising rotative coupling means coupling said rotating base with said head, said rotative coupling means comprising: a first disc member forming part of said rotating base and having one side surface provided with a cylindrical hub, said first disc member extending substantially parallel with a plane perpendicular to the axis of said rotating base; a second disc member forming part of said head and disposed in facing relation to said one side surface of said first disc member, said second disc member having a boss formed at a center thereof and disposed around said hub of said first disc member; a cover



disposed over said hub of said first disc member and said boss of said second disc member; means fixing said cover to said hub of said first disc member; an annular bearing member formed of synthetic resin and interposed between said one side surface of said first disc member and said second disc member; a cylindrical bearing member formed of synthetic resin and interposed between said hub of said first disc member and said boss of said second disc member; and stopper means for keeping said second disc member engaged with said first disc member against disengagement therefrom, wherein said first disc member is rotatable relative to said second member through sliding intervention of said annular and cylindrical bearing members therebetween.

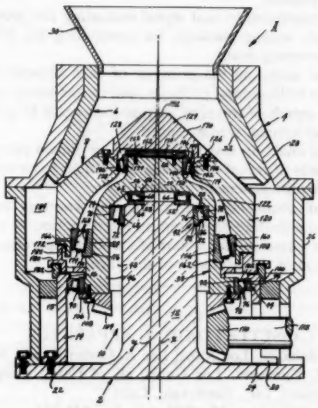
4,512,525

CONE TYPE ROCK CRUSHER AND BEARING ARRANGEMENT THEREFOR

Robert W. Cameron, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Apr. 2, 1979, Ser. No. 25,992
Int. Cl.[3] B02C *2/04*
U.S. Cl. 241—207 **19 Claims**

1. A crusher comprising: a base; a fixed member projected upwardly from the base and being fixed in position with respect to the base; an intermediate member surrounding the fixed member; first bearing means for enabling the intermediate member to rotate with respect to the fixed member about the axis of the first bearing means, the first bearing means including a thrust bearing located at the upper end of the fixed member where it is between the fixed member and the intermediate member so as to transmit thrust loads from the intermediate member to the fixed member, the first bearing means also including a tapered roller radial bearing surrounding the fixed member near the thrust bearing and being located between the side of the fixed member and the intermediate member, so as to transfer radial loads from the intermediate member to the fixed member, the radial bearing having a single row of tapered rollers with the large diameter ends of the tapered rollers being presented downwardly, the tapered roller radial bearing further being positioned to also transmit some of the thrust load from the intermediate member to the fixed member; means for rotating the intermediate member; a crusher head positioned generally around the intermediate member, the crusher head having an upwardly presented crushing surface; second bearing means between the crusher head and the intermediate member to enable the intermediate member to rotate within crusher head, the axis of the second bearing means being oblique to the axis of the first bearing means, whereby the head will wobble as the intermediate member rotates; a housing extending over the head, the housing having an inlet located



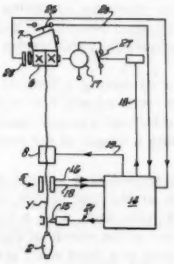
above the head so that material to be crushed may be directed through the opening and toward the head; and a downwardly presented crushing surface located in a generally fixed position within the housing, the crushing surface of the housing being positioned opposite to, yet spaced from, the crushing surface on the head, so that material introduced into the housing through the opening will be crushed in the space between the two crushing surfaces as the crusher head wobbles.

4,512,526

DOFFING CONTROL SYSTEM IN AUTOMATIC WINDER

Syoiti Tone, and Norio Kubota, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisa, Japan

Continuation of Ser. No. 366,476, Apr. 8, 1982, abandoned. This application Aug. 28, 1984, Ser. No. 645,524
Claims priority, application Japan, Apr. 13, 1981, 56-56057
Int. Cl.[3] B65H *54/26, 63/00*
U.S. Cl. 242—36 **7 Claims**



1. A control system for controlling the doffing of a fully wound package of yarn in each of a plurality of winding units comprising an automatic yarn winder, wherein each winding unit includes a package, a cop supplying yarn to be wound onto said package, a slub catcher, and a driven traversing drum

for driving said package to wind the yarn thereon, and wherein said automatic winder provides means for cutting the yarn upon detection of a slub by said slub catcher and means for knotting ends of said yarn together upon detection of a yarn breakage or resupply condition, said means for cutting and said means for knotting being relocatably disposed to service a plurality of said winding units, said control system comprising:

means for detecting the presence of a fully wound package and emitting a signal indicating when a fully wound package is present;

means, responsive to said signal indicating the presence of the fully wound package, for controlling the driving of the traversing drum;

means for detecting the presence of yarn between the cop and the fully wound package, said means being operative for all speeds of travel of yarn at least equal to or exceeding a set critical sensing speed;

means for enabling said slub catcher to remain operative at all speeds of travel of yarn at least equal to or exceeding said set critical sensing speed;

means for commanding a cutting and knotting operation prior to a doffing operation on the detection of slub; and

means for commanding a start of a doffing operation on the detection of the presence of the yarn.

4,512,527

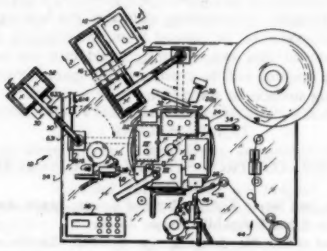
CASSETTE LOADING APPARATUS

George D. Rehklau, Los Altos; Lee A. Cotterill, San Jose, and Robert Z. Langevin, Los Gatos, all of Calif., assignors to Electro-Sound, Inc., Sunnyvale, Calif.

Filed Oct. 22, 1982, Ser. No. 436,051

Int. Cl.³ B65H *19/26, 21/00*

U.S. Cl. 242—56 R **52 Claims**



1. Cassette loading apparatus for winding tape into cassettes having a tape leader connected between at least two spools comprising:

tape supply means for providing recording tape;

transport means receiving a plurality of cassettes for carrying each cassette sequentially in a stream by a plurality of work stations;

extraction means for extracting a loop of the tape leader from each cassette received at a first work station;

holder means carried by said transport means for receiving, aligning and holding a length of the tape leader forming the loop;

first cutter means disposed at a second work station for cutting the length of the tape leader creating first and second leader segments each with a cut end and each connecting with one of the spools of the cassette;

splicing means disposed at a third work station for splicing an end of the recording tape to the cut end of said first leader segment attached to a first spool of said cassette;

winding means disposed at said third work station for engaging and rotating the first spool of the cassette and winding a desired length of the recording tape about such spool;

second cutter means disposed at said third work station for cutting said recording tape creating a first cut end thereof thereof terminating the recording tape wound about the first spool of the cassette and a second cut end terminating the recording tape from the supply means;

splicing means disposed at a fourth work station for splicing the cut end of said second leader segment to the first cut end of the recording tape, whereby at least four cassettes are being operated on simultaneously.

4,512,528

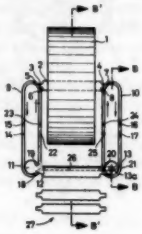
DEVICE FOR EXCHANGING A WINDING MANDREL

Klaus G. Kuhn, Wingertweg 52, 8750 Aschaffenburg 19, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,490

Int. Cl.³ B65H *17/12, 19/06*

U.S. Cl. 242—56 R **21 Claims**



1. In an apparatus for winding continuously-fed sheet material on a material receiving winding mandrel, an improved device for the exchange of a full winding mandrel and an empty winding mandrel without interruption of the continuously-fed sheet material to be wound, said device comprising:

a movable, endless conveyor for the horizontal transport of both a full winding mandrel from a winding station and an empty winding mandrel to said station;

means carried by said movable, endless conveyor for coupling and uncoupling a winding mandrel thereto to permit an empty winding mandrel to be received by said conveyor, transported to said winding station for receiving continuously-fed sheet material, and transported to a removal station for removal as a full winding mandrel; and

vertical guiding means carried by said conveyor for vertically guiding a winding mandrel while coupled to said conveyor.

4,512,529

WINDING MACHINE

Eberhard Kampf, Muehlener Strasse 44, 5276 Wiehl, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,551

Claims priority, application European Pat. Off., Jun. 25, 1982, 82105629.8

Int. Cl.³ B21C *47/02;* **B65H** *79/00*

U.S. Cl. 242—67.1 R **4 Claims**

1. A winding machine comprising:

(a) individual slides cooperating in pairs and being movable on a slide guide,

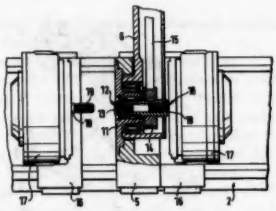
(b) swivelable pendulum arms carried by said slide guides, each pendulum arm comprising:

(i) a hollow driving shaft positioned at one end of the pendulum arm coaxially with the swivel axis of the pendulum arm, and

(ii) a receiver device at the other end of the pendulum arm adapted to be driven by the driving shaft;

(c) a motor for engaging one end of at least one of said hollow shafts,

(d) a winding core carried by the receiver devices in two adjacent pendulum arms,



(e) at least one additional motor for possible and selective connection to at least one of said hollow shafts.

4,512,530

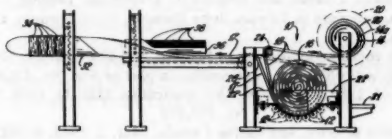
APPARATUS FOR HANDLING SPLIT-BATT ROLLS

William C. Rauschert, Montgomery, Tex., and Leo A. Oswald, Huntingdon, Pa., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 12, 1984, Ser. No. 588,618

Int. Cl.³ B65H *17/00*

U.S. Cl. 242—67.3 R **3 Claims**



1. Handling apparatus for composite two-batt rolls of glass wool insulation, said apparatus comprising a plurality of rotatably mounted rollers of relatively small diameter disposed in a generally arcuate upwardly concave arrangement, a rotatably mounted roller of relatively large diameter disposed in suitably spaced relationship with the plurality of rollers of relatively small diameter, means for continuously rotating the large-diameter roller, and a non-rotatable bar disposed in suitably spaced relationship with the large-diameter roller, the large-diameter roller being sufficiently large to establish frictional driving engagement with a first winding of a batt of glass wool insulation wrapped therearound as long as there is slack in a following portion of the batt to be wound, whereby glass wool insulation in the form of two batts wound together in a composite roll may be rotatably supported along a lower portion of the periphery of the composite roll by the plurality of rollers of relatively small diameter and a radially outer batt of the composite roll may be intermittently pulled therefrom while a radially inner belt of the composite roll is wound into a separate roll on the rotating large-diameter roller, the non-rotatable bar operatively engaging the inner batt during the winding thereof on the large-diameter roller and insuring that, after no slack remains therein, the large-diameter roller does not pull the inner batt from the composite roll independently of the pulling of the outer batt therefrom.

4,512,531

FISHING REEL WITH TRAVERSE-CAM MEMBER ROTATABLY MOUNTED ON ANTI-REVERSE SHAFT

Kikuo Tunoda, Fuchu, Japan, assignor to Ryobi Limited, Hiroshima, Japan

Filed Oct. 21, 1983, Ser. No. 544,449

Claims priority, application Japan, Oct. 25, 1982, 57-162180[U]

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—84.21 R **10 Claims**

1. A fishing reel comprising:

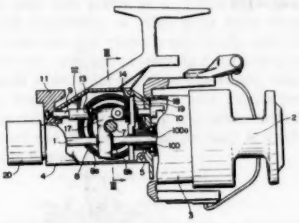
a housing; a rotor

a spool shaft mounted in the housing;

a traverse cam member mounted in the housing;

oscillator means for reciprocating the spool shaft, said oscillator means having one end portion thereof secured to said spool shaft and another end portion thereof engaged with said traverse-cam member;

a master gear coupled to said traverse-cam member for rotating said traverse-cam member;



anti-reverse means including an anti-reverse shaft arranged inside said housing in parallel with said pool shaft;

said traverse-cam member being formed as a cylinder and being mounted on said anti-reverse shaft so as to be rotatable relative to said anti-reverse shaft; and

said master gear being provided with outer and inner face gears, one of which rotates said rotor of the fishing reel and the other of which is coupled to rotate said traverse-cam member.

4,512,532

YARN LIMITING DISC DEVICE

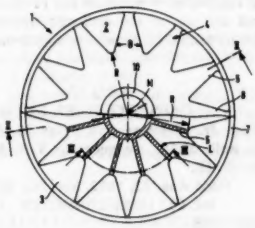
Horst Dittrich, Industriestrasse 9, 6382 Friedrichsdorf, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,876

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235156

Int. Cl.³ B65H *75/22*

U.S. Cl. 242—116 **19 Claims**



1. A yarn limiting disc device for use in winding a yarn package on a yarn package carrier such as a loom beam, a warp beam, a weaver beam or a sectional beam of a textile machine, said device comprising:

a substantially planar, annular disc body adapted to have extend therethrough a beam of a yarn package carrier onto which a yarn package is to be wound;

a plurality of hollow reinforcing ribs extending generally radially along one side of said disc body; and

said body and said ribs being integrally formed as a single unitary member defining a hollow internal cavity between said body and each said rib.

4,512,533

PROCESS AND APPARATUS FOR UNWINDING COILS OF WIRE

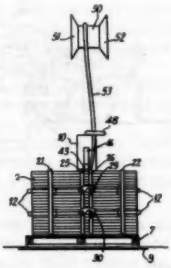
Fernand Morival, 51, route de Tournai, 59226 Lecelles, and Anne Morival, 11, rue Jean Jaures, 59178 Hasnon, both of France

Continuation-in-part of Ser. No. 451,950, Dec. 21, 1982,. This application Apr. 4, 1984, Ser. No. 596,553

Claims priority, application France, Apr. 13, 1983, 83 06328

Int. Cl.³ B65H *49/00*

U.S. Cl. 242—129 **21 Claims**



1. Apparatus for winding hollow coils of wire by drawing wire upwardly from the central hole of a coil, characterized by

(a) a plate for supporting a coil of wire with the axis of its central hole disposed vertically,

(b) a main vertical upright firmly affixed to the plate,

(c) an articulated corset element mounted pivotally on the main upright for holding the coil stationary during unwinding, said corset element being constituted of horizontal cross-pieces composed of articulatory sections and vertical uprights,

(d) corset actuating means operative to close the corset element to grip the coil of wire externally during unwinding and to open the corset element sufficiently to permit the placement of a coil on the plate,

(e) a pressure device extending over the coil and being operative to bear downwardly on the top of the coil to stabilize the coil during unwinding and

(f) pressure device actuating means for moving the pressure device vertically, said pressure device actuating means being operative to advance the pressure device to press against the top of the coil and to retract the pressure device to enable placement of a coil on the plate.

4,512,534

CASSETTE REEL LOCK

Don R. Coy, Jr., Palatine, and Peter M. Giannis, Arlington Heights, both of Ill., assignors to T/B & H Home Video, Northbrook, Ill.

Filed Aug. 12, 1982, Ser. No. 407,501

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—198 **10 Claims**

9. A reel locking mechanism for a tape cassette comprising:

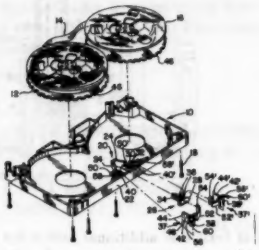
at least one cassette housing half;

a reel lock having means for engaging a reel in the cassette to prevent rotation of the reel;

mounting means for stationarily mounting said reel lock on said housing half, but allowing rotation of said reel lock on said housing half between reel engaging and disengaging positions;

spring means including a resilient arm extending angularly to said reel lock, and having one end formed integrally and in one-piece relationship to said reel lock, the other end of said arm being free and unattached and including an enlarged portion adjacent said other end of said arm; and

spring engaging means mounted stationarily on said housing half, said resilient arm slidably contacting said spring engaging means along the length of said arm when said



reel lock is rotated between said reel engaging and disengaging positions to urge said reel lock toward said reel engaging position.

4,512,535

TAPE CASSETTE WITH CLUTCH ASSEMBLY

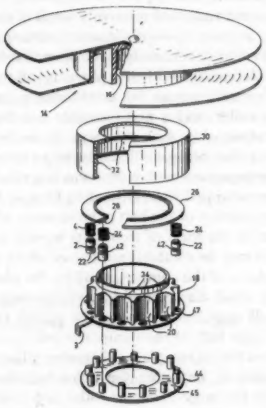
Edward J. Dickson, 55 Charles St. W., Apt. 3103, Toronto, Ontario, Canada, and Richard J. Armstrong, Toronto, Canada, assignors to Edward John Dickson, West Toronto, Canada

and a continuation-in-part of Ser. No. 544,505, Oct. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 476,916, Mar. 21, 1983, abandoned. This application Mar. 21, 1984, Ser. No. 591,915

Claims priority, application Canada, Mar. 2, 1983, 422682

Int. Cl.³ G11B *15/32, 23/04;* B65H *17/02*

U.S. Cl. 242—200 **12 Claims**



1. A cassette having a casing and reels mounted for rotation within the casing and connectable to a rotatable drive shaft to transfer tape from one reel to the other characterized by:

locking means for locking one of said reels against rotation with respect to the casing in only one direction when operative;

said locking means being releasable to render it inoperative and to permit said reel free rotation with respect to the casing in either direction;

said locking means including a roller cage, brake means and rollers;

one of said roller cage and brake means being nonrotatable

with respect to said body the other of the roller cage and brake means being nonrotatable with respect to the reel;

said roller cage having a series of channels arranged in a circle;

each channel of said series of channels having one of said rollers therein;

said brake means having a brake surface;

said roller cage and said brake surface of said brake means defining a space therebetween that is annular in cross section, each of said channels of said series of channels having a ramp surface at its bottom that slopes towards the brake surface on the brake means in the direction against which the locking means locks;

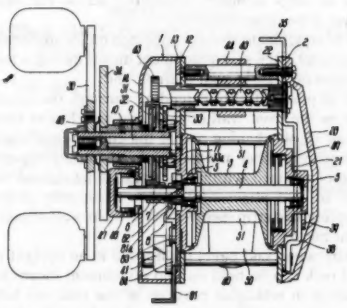
said rollers being moveable longitudinally of their respective channels between positions to dispose said locking means in an operative position or an inoperative position, said operative position being one where the rollers wedge between a brake surface of the brake means and the ramp surface of the roller cage to lock against rotation of reel with respect to the casing in one direction and permit free rotation in the other direction, the inoperative position being one where the rollers will not wedge between the roller cage and brake means whereby to permit free rotation of the reel with respect to the casing in either direction of rotation; the distance in a radial direction across the space of annular cross section between the roller cage and brake surface being of a length that is different for the operative position of the rollers and the inoperative position of the rollers, the said distance being longer in the inoperative position than the operative position and long enough in the inoperative position to avoid wedging between the roller cage and brake means as aforesaid and short enough in the operative position to cause wedging between the roller cage and brake means as aforesaid.

4,512,536

FISHING REEL

Jun Sato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 344,746, Feb. 1, 1982, abandoned. This application Nov. 7, 1983, Ser. No. 549,220
Claims priority, application Japan, Feb. 9, 1981, 56-17506
Int. Cl.³ A01K *89/015*
U.S. Cl. 242—218 **3 Claims**



1. A fishing reel comprising:

first and second side frames;

a spool supported rotatably between said side frames;

a handle supported rotatably to said first side frame;

a transmission mechanism including a clutch for transmitting rotation of said handle to said spool, and

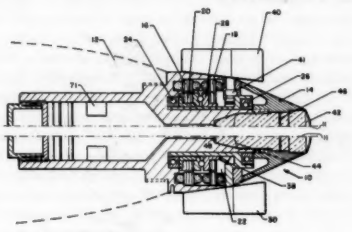
a clutch control mechanism having a clutch lever for engaging or disengaging said clutch, said second side frame opposite to said first side frame being provided with a clutch operating member, said first and second side frames being provided with an association mechanism including an association shaft journalled between said side frames for mechanically coupling said clutch operating member with said clutch lever so that operation of said clutch operating member causes said clutch control mechanism to operate said clutch, said clutch lever projecting outwardly from said first side frame, so that the projecting portion of said clutch lever also is operable to cause said clutch control mechanism to operate said clutch, said first and second side frames being provided with side plates and covers respectively, said association shaft being journalled to said side plates at said first and second side frames and projecting at both axial ends thereof outwardly from said side plates respectively, and having an association arm at a first projecting axial end of said association shaft at a side of said first side frame, said association arm being connected with said clutch lever, said clutch operating member being connected with said projecting axial end of said association shaft at a side of said second side frame.

4,512,537

CANARD CONTROL ASSEMBLY FOR A PROJECTILE

George Sebestyen, Weston, Mass.; Ronald R. Sinclair, Moultonboro, N.H.; John A. Smith, Bedford, Mass.; Timothy B. Sands, Acton, Mass., and Theodore J. Nussdorfer, Lexington, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 10, 1973, Ser. No. 392,716
Int. Cl.³ F42B *13/28, 15/02*
U.S. Cl. 244—3.21 **10 Claims**



1. Apparatus for providing precision correction to the trajectory of a standard gun-fired projectile by providing a device which is adapted to be screwed into the fuze well of the standard projectile, comprising:

a main housing having means for inserting same into the fuze well of the gun-fired projectile thereby adapting the projectile to supply guidance thereto;

a canard frame coupled to said main housing for relative rotation thereto about the longitudinal axis thereof;

said canard frame having deflectable canards thereon; and

means for deflecting said canards to guide the projectile.

4,512,538

DEVICE FOR MAINTAINING A DETONATING CORD AGAINST A TRANSPARENT AIRCRAFT CANOPY MEMBER

Jules H. P. Devienne, Sartrouville, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Mar. 1, 1983, Ser. No. 470,944
Claims priority, application France, Mar. 4, 1982, 82 03609
Int. Cl.³ B64D *25/08*
U.S. Cl. 244—122 AF **12 Claims**

1. A device for maintaining a detonating cord against a transparent aircraft canopy member, said device comprising a closed sheath within which is placed the detonating cord, an outer envelope, whereof a first part, entirely surrounding the closed sheath, is maintained against the transparent member and whereof a second part is fixed to a longeron the cross-sec-

tion of which is shaped in such a way that it defines a first surface forming a dihedral angle with the surface of the transparent canopy member, the part of the outer envelope sur-

rounding the closed sheath being kept against both the transparent canopy member and the first surface, as well as a second surface, to which is fixed the second part of the outer envelope.

4,512,539

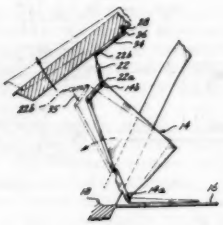
ESCAPE SLIDE DEPLOYMENT SYSTEM

Albert B. Ackermann, Fountain Valley, Calif.; Donald K. Jones, Bellevue, and Timothy M. Holey, Marysville, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 15, 1983, Ser. No. 523,184

Int. Cl.³ B64D *25/14*

U.S. Cl. 244—137 P **9 Claims**



1. A deployment apparatus for use in moving an escape slide contained in a stowage pack from a position within an aircraft adjacent the sill area of a door opening in the aircraft fuselage, through the door opening to a position exterior to the aircraft fuselage, said aircraft including a door movably mounted in said door opening and operable to swingably move between an open position and a closed position, said deployment apparatus comprising:

a rigid elongate deployment arm having a first portion, a first end of said first portion being swingably attached to said stowage pack, and a second portion slidably engaging said first portion such that a first end of said second portion is movable longitudinally with respect to said first portion to make said deployment arm extensible;

arming means movably mounted on an interior surface of said door, said arming means being movable between a first position in which it is out of engagement with said deployment arm and a second position in which it cooperably engages said first end of said second portion of said deployment arm, said arming means engaging and capturing said first end of said second portion of said deployment arm as it moves from said first position to said second position; and

elongate guide track means fixed to the interior surface of said door, said arming means cooperable with said guide track means when said arming means is in said second position to guide said first end of said second portion of said deployment arm into a first end of said guide track means as said door is moved from said closed position toward said open position, said first end of said second portion of said deployment arm moving along the elongate dimension of said guide track means as said door moves toward said open position until it exits from a second end of said guide track means when a predetermined degree of movement of said door has been exceeded.

4,512,540

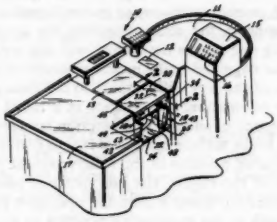
PLASTIC BAG RACK FOR CHECKSTAND

Alvin L. Stroh, Downey, Calif., assignor to McMillin Wire and Plating, Inc., Los Angeles, Calif.

Filed Apr. 18, 1983, Ser. No. 486,262

Int. Cl.³ B65B *67/12*

U.S. Cl. 248—95 **10 Claims**



1. A combination of a plastic bag rack and an adjustable mount for mounting said rack on the undersurface of a panel movable between a position in which it covers a well provided in the table top of a checkstand at a supermarket and an upright position on the rear of said well, said combination comprising:

a rack having a pair of side support arms, each said side support arm including a front and rear shoulder;

a downwardly and rearwardly extending bottom side member joined to the end of each of the front shoulders;

an upper transverse member for joining the ends of the rear shoulders;

a lower transverse member for joining the ends of the downwardly and rearwardly extending bottom side members;

a pair of strip members connected across the upper and lower transverse members;

a pair of attachment means connected on the undersurface of said panel, each said attachment means having a longitudinal slot on a front wall thereof; and

a pair of pins slideably extending through the longitudinal slot on the front wall of each said attachment means;

said pair of pins having one of the ends thereof engaged to said strip member and having heads on the opposite ends thereof retained within the longitudinal slot on the front wall of said attachment means to thereby provide for coupling said strip member to the front wall of said attachment means;

whereby when said panel is disposed in an upright position said rack can be held on said attachment means in a first location in which all portions of the rack are below the upper edge of said panel and a second location in which a portion of the rack is elevated above the upper edge of said panel.

4,512,541

DISPLAY STAND

G. W. Lietzke, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 15, 1982, Ser. No. 358,220

Int. Cl.³ A47B *97/04*

U.S. Cl. 248—459 **3 Claims**

1. A display stand including integral base and header mem-

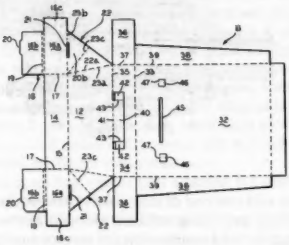
bers formed from a unitary blank of foldable sheet material such as paperboard, comprising:

(a) a header member including a vertically disposed display panel having a pair of support flanges foldably joined to opposite side edges thereof and disposed to extend rearwardly from said panel for support thereof;

(b) said panel presenting, adjacent a lower end thereof a retaining slot extending therethrough;

(c) a base member including a rear wall, a top wall, and a front wall foldably joined to form a box-like structure;

(d) said base member rear wall being foldably joined at a lower edge to a lower edge of said display panel and folded to lie in face-to-face engagement with a front surface of said display panel;



(e) said base member rear wall including a retaining flap cut from material thereof, folded thereto at an upper edge thereof, and disposed to extend through said display panel retaining slot to provide interlocking engagement therebetween;

(f) said base member rear wall having foldably joined to opposite ends thereof a pair of intermediate end flaps;

(g) said base member front wall having foldably joined to opposite ends thereof a pair of outer end flaps;

(h) each of said outer end flaps having foldably joined to a lower edge thereof an inner end flap;

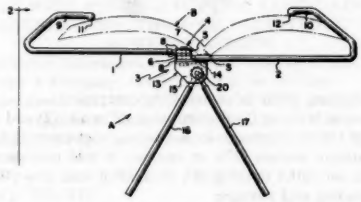
(i) each of said base member intermediate end flaps being sandwiched between a related pair of inner and outer end flaps.

4,512,542

BOOK HOLDER

Maurice Black, 2412 S. Washington Ave., Saginaw, Mich. 48601

Filed Sep. 29, 1982, Ser. No. 426,280
Int. Cl.³ A47B *97/04*
U.S. Cl. 248—460 **11 Claims**



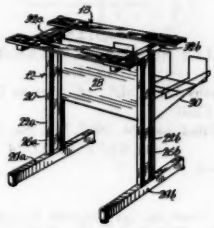
1. A book holder comprising a pair of limbs extending in opposite directions from a central zone; a reversely turned finger at the free end of each of said limbs extending alongside and spaced from the associated limb, the spacing between one finger and its limb being less than that between the other of said fingers and its limb by an amount sufficient to enable said one finger to nest with the other of said fingers; and means coupling said limbs to one another at said zone and enabling relative movement between said limbs in such manner as to move said limbs between a number of positions, one of said limbs being longer than the other by such an amount that in one of said positions of said limbs said one finger nests with the other of said fingers.

4,512,543

UNIVERSAL PRINTER STAND

David C. Petrick, Park Ridge, Ill., assignor to Bretford Manufacturing, Inc., Schiller Park, Ill.

Filed Sep. 27, 1982, Ser. No. 424,403
Int. Cl.³ F16M *11/00*
U.S. Cl. 248—670 **20 Claims**



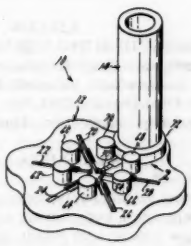
1. A universal printer stand for supporting any one of a number of printer types each having support legs separated from one another by lateral and longitudinal distances which depend upon the particular type of printer to be supported, comprising: a platform having a pair of spaced support members and a pair of spaced cross members secured to and transversely disposed with respect to the support members to afford an upper platform surface; receiving means disposed on the cross members for supporting the legs of the printer including extender brackets disposed on each of the cross members; means for adjusting the receiving means to accommodate the lateral and longitudinal distances between the printer support legs; and means for supporting the platform such means being positioned below the upper platform surface and being in noninterfering relationship with the adjusting means.

4,512,544

BOTTOM POUR INGOT MOULD SYSTEM

Paul D. Eckenrode, Newton Falls; Richard P. Eisenbrei, and James E. Nixon, both of Youngstown, all of Ohio, assignors to Microdot Inc., Darien, Conn.

Filed Sep. 1, 1982, Ser. No. 413,609
Int. Cl.³ B22D *7/06, 41/08*
U.S. Cl. 249—109 **3 Claims**



1. A bottom pour ingot mould system comprising:

a sprue plate having a support surface for the support of an ingot mould, an inlet aperture for the acceptance of molten steel, an outlet aperture for the discharge of molten

steel, and a horizontally extending runner below the support surface thereof communicating with the inlet and outlet apertures,

a pair of vertically extending integral guide pads on said sprue plate between the inlet and outlet apertures therein and disposed on opposite sides of said runner, and

an ingot mould on the support surface of said sprue plate having a bottom inlet for the acceptance of molten steel, said guide pads extending above the support surface on said sprue plate so as to engage said mould upon horizontal movement thereof relative to said sprue plate, abutment of said ingot mould against each of said guide pads positively positioning the bottom inlet therein over the outlet aperture in said sprue plate.

4,512,545

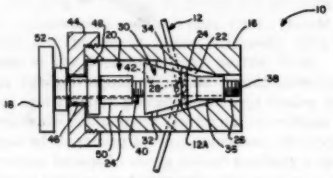
EXTERNALLY ACTUATED VALVE ASSEMBLY AND METHOD

Dav Mar, Sunnyvale, Calif., assignor to Dionex Corporation, Sunnyvale, Calif.

Filed Jun. 24, 1982, Ser. No. 391,571

Int. Cl.³ F16L *55/14*

U.S. Cl. 251—4 **6 Claims**



1. A valve assembly for controlling the flow rate of a fluid through an elastomeric conduit including a section thereof having an inner pasageway, said assembly comprising: first means configured as a right-circular conic section having an outer conic surface adapted to support said section of conduit such that the latter makes at least one turn around said surface at approximately a right angle with one axis of the conic section, second means defining a cavity having an inner surface disposed around and corresponding in conic configuration to said outer surface with a spacing therebetween for accommodating said conduit section; and means for moving said conic section along its conic axis between adjustably fixed positions relative to said cavity in order to change the spacing between said inner and outer surfaces for squeezing said conduit section and changing the cross-sectional configuration of its passageway a proportionate amount, whereby to control the flow rate of fluid therethrough.

4,512,546

SOLENOID ACTUATED VALVE DEVICE

Masami Inada, and Kenji Hashimoto, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

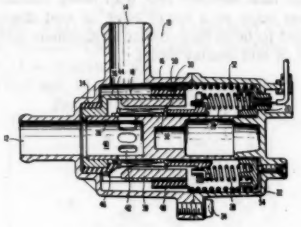
Filed Dec. 29, 1981, Ser. No. 335,430

Claims priority, application Japan, Dec. 29, 1980, 55-187712[U]

Int. Cl.³ F16K *31/08*

U.S. Cl. 251—65 **1 Claim**

1. A solenoid actuated valve device for controlling the flow of fluid comprising a body having an inlet port and an outlet port, a hollow tubular core axially mounted within said body with one end thereof disposed in communication with said outlet port and having at least one radially extending aperture therethrough to provide communication between said inlet port and said outlet port, an annular yoke supported at one end thereof on said one end of said core, a bobbin having valve means being slidably mounted on said core within said yoke to control the effective open area of said aperture, a solenoid coil wound on said bobbin, permanent magnet means secured within said yoke so that the magnetic flux thereof intersects the windings of said solenoid coil at right angles thereto whereby a magnetic circuit is defined by said yoke with said core and permanent magnetic means to provide a magnetic force causing said bobbin to move relative to said core when electric current passes through said coil, spring means biasing said bobbin to a position wherein said valve means closes said aperture, first resilient means sealingly mounting said one end



of said core and said one end of said yoke in said body adjacent said inlet port and providing resilient stopper means for said valve means and second resilient means supporting the opposite end of said yoke within said body wherein said yoke is provided with apertures through which a portion of said first resilient means protrude to define said resilient stopper means for said valve means and is provided with additional passage means communicating said apertures in said core with said outlet port.

4,512,547

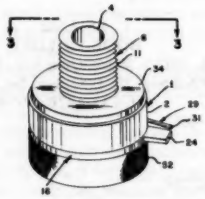
LOCKING DRAIN VALVE

Duane C. Balch, Napa, Calif., assignor to Chartwell Corporation, Line Lexington, Pa.

Filed May 6, 1983, Ser. No. 492,450

Int. Cl.³ F16K *35/02*

U.S. Cl. 251—115 **3 Claims**



1. A locking drain valve assembly comprising:

a. a valve housing (1) formed with sidewalls (2) and a passage (3) therethrough including an inlet opening (4), an upstream portion (17), an opening in said upstream portion, an outlet opening (5), an annular seat area (40) surrounding said passage;

b. said housing being formed with connection means (6) adapted for connection to a fluid source (7);

c. said housing being formed with a transverse slot (12) intersecting said passage creating an opening (41) in said passage and terminating at an inside slot wall (13) within said housing;

d. a slide gate member (16) dimensioned for registration within said transverse slot and having a portion (39) dimensioned for covering said annular seat area (40) and said opening (41) in said upstream portion (17) of said passage;

e. pin means (19) connected to said housing and said slide gate for pivotal movement of said slide gate into and out of closure position with said opening (41) in said upstream portion (17) of said passage (3);

f. said slide gate being formed with a finger engageable lever (24) extending beyond said side of said housing;

g. slide gate sealing means (25) mounted in said housing surrounding said passage and sealably engaging said slide gate member in said closed position for preventing flow of fluid through said passage;

h. said slide gate being formed with a spring latch engageable portion (42);

i. spring latch means (29) having a curvilinear cross section moveable between a latched and an unlatched position, including a proximal end (30) connected to said housing and a distal end (31) projecting beyond said side wall (2) adapted for finger engageable release, a V-shaped portion (32) formed adjacent said distal end for releasable engagement with said spring engageable portion in said slide gate in said closed position of said slide gate, a mid-portion (33) arcuately formed between said V-shaped portion and said proximal portion extending from said side of said valve body in said unlatched position and moveable to a latched position by finger compression;

j. housing sealing means (34) adapted for sealing said valve housing to said fluid source;

k. a portion of said side of said housing is formed with an annular groove (36) dimensioned for receiving a portion of said spring latch means;

l. the proximal end (30) of said spring latch means is formed with a hook shape for operative non-removeable engagement of an end of said annular groove and said inside slot wall permitting spring deforming rotational movement of said distal end of said spring latch means relative to said proximal end;

m. spring latch holding means (35) formed in said housing for releasably engaging said "V38 shaped portion of said spring latch means when said spring latch means is moved to said unlatched position permitting easy unbiased movement of said slide gate between said open and closed positions;

n. said spring latch means is positioned with respect to said slide gate so that it must be moved counter to said slide gate to effect unlatching; and p1 o. said sealing means (25) includes an annular groove (26) formed in said housing surrounding said passage in an upstream side of said slot; and

p. an "o" ring (27) dimensioned for receipt within said annular groove and dimensioned for sealing receipt with said slide gate in said closed position.

4,512,548

VALVE WITH A DEVICE FOR THE ATTENUATION OF ACOUSTIC VIBRATIONS SELF-EXCITED BY THE WORKING MEDIUM

Jakob Keller, Killwangen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

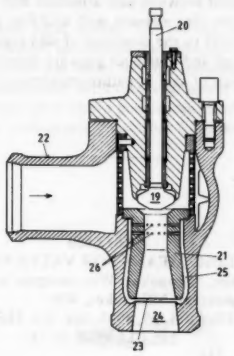
Continuation of Ser. No. 239,588, Mar. 2, 1981, abandoned. This application Jan. 19, 1984, Ser. No. 571,648

Claims priority, application Switzerland, Feb. 28, 1980, 1587/80

Int. Cl.³ F16K *1/34*

U.S. Cl. 251—124 **4 Claims**

1. In a fluid valve of the type comprising a housing, a valve seat surrounding an opening, a closure for the seat to close-off said opening, and a diffuser including a wall having a generally annular surface therein forming a diffuser channel disposed downstream of said seat for recovering pressure energy in the working medium, the improvement comprising conduit means fluidly intercommunicating a region within said diffuser channel where a flow separation point occurs and a portion of said valve where pressure is higher than at said region during operation, to stabilize said flow separation point and minimize resulting noise, said conduit means comprising an annular passage surrounding said diffuser and a plurality of holes in said diffuser wall surface and communicating with an area of narrowest cross-section of said diffuser channel, said area of narrowest cross-section having a cross-section no larger than



the cross-section of said opening of said seat, said diffuser channel being disposed in contiguous relationship with said opening so that no gap is formed therebetween, the length of said diffuser channel being longer than a diameter of said narrowest cross-section.

4,512,549

MAGNETIC VALVE

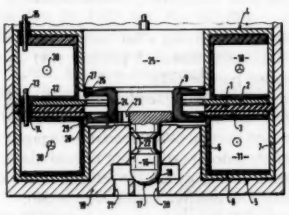
Theodor Gast, Berlin; Hans Kubach, Korntal, and Kurt Binder, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,715

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136734

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—137 **7 Claims**



1. A magnetic valve having at least one soft-iron core means and further provided with a movable armature of magnetically conductive material, which carries a valve body, and a disc shaped permanent magnet surrounding said armature and interposed between oppositely disposed fixed first and second magnetic conductor disc elements of which said permanent magnet is in magnetic contact for reinforcing movement of said armature positioned in proximity thereto, characterized in that said soft-iron core means comprises first and second soft-iron cores which are disposed parallel to one another, each of said cores arranged to surround a coil member, said armature is formed as an annular element adapted for reciprocable movement under influence of a magnetic field established by said coil members, said permanent magnet, said magnetic cores and said disc elements, each of said conductor disc elements having portions physically in contact with said soft-iron core means and in magnetic contact therewith, and a first air gap

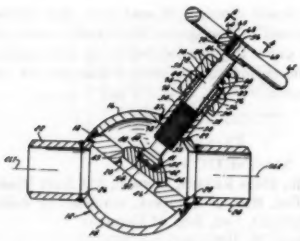
disposed between said armature and the first magnetic conductor disc element, a second air gap disposed between said armature and said first soft-iron core, a third air gap disposed between said armature and said second soft-iron core and a fourth air gap disposed between said armature and said second magnetic conductor disc element with said first and third air gaps disposed parallel to the direction of said armature movement, and said second and fourth air gaps are disposed perpendicular to the direction of said armature movement.

4,512,550

SEALING MEANS FOR VALVE SPINDLE

Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Jul. 25, 1983, Ser. No. 516,685
Int. Cl.³ F16K *41/00*
U.S. Cl. 251—214 **4 Claims**



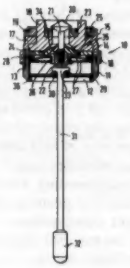
1. A valve (60) comprising:
a hollow valve body (12) having a hole (35) therein;
a hollow sleeve (30) secured to said body (12) and having a sleeve bore therethrough communicating with said hole (35);
said sleeve (30) having a flat annular outer end surface (81), an externally threaded portion (34) and an internally threaded portion (32);
a valve spindle (36) extending through said sleeve (30) and having an unthreaded portion (55) and an externally threaded portion (38) threadably engaged with said internally threaded portion (32) of said sleeve (30) whereby rotation of said spindle (36) effects axial movement of said spindle (36) relative to said sleeve (30);
a bonnet (74) having a bonnet bore (84) therethrough for accommodating said sleeve (30) and said spindle (36) and having an internally unthreaded portion (86) for receiving said unthreaded portion (55) of said valve spindle (36) and having an internally threaded portion (76) in said bonnet bore (84) threadably engaged with said externally threaded portion (34) of said sleeve (30), said bonnet (74) having a flat annular flange (83) extending inwardly into said bonnet bore (84), said unthreaded portion (86) of said bonnet bore (84) having a plurality of annular grooves (88) formed therein;
first compressible deformable packing material sealing means (78) entrapped in said bonnet bore (84) between said flat annular flange (83) and said flat annular outer end surface (81) of said sleeve (30);
and second resiliently compressible deformable resilient sealing means in the form of O-rings (80) entrapped in said grooves (88) between said bonnet (84) and said unthreaded portion (55) of said valve spindle (36).

4,512,551

DEVICE FOR RELEASING THE FLOW OF WATER IN A WATER FAUCET

Gotthilf R. Dalferth, Auf den Felsen 25, D-7140 Ludwigsburg-Poppenweiler, Fed. Rep. of Germany

Filed Jun. 9, 1983, Ser. No. 505,154
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222004
Int. Cl.³ F16K *31/254*
U.S. Cl. 251—339 **17 Claims**



1. Device for releasing the flow of water from a water faucet by a valve means enclosed within a casing (10) connectible at its inlet with said faucet opening, said valve means opening and closing said inlet opening with a valve body (20), said valve body (20) resting on a valve seat (23) facing said inlet opening of said casing (10) and actuated by operating lever (31) extending out of the outlet opening of said casing (10) and having an operating plate (33) within said casing and supported in the vicinity of said outlet opening of said casing so as to pivot in all directions removing said valve body (20) from said valve seat (23) by said pivot action, characterized in that said operating lever (31) is supported in a center bushing (30) of an annular perforated disc insert (29) covering said outlet opening of said casing (10) and is held suspended therein by said operating plate (33).

4,512,552

CORROSION INHIBITOR

Sakae Katayama, Osaka; Tadahiko Asano, Sennan; Kazuo Marugame, Sakai; Sadaoki Kanada, Ibaraki, and Yoshinari Kawasaki, Osaka, all of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka, Japan

Filed Nov. 16, 1982, Ser. No. 442,136
Int. Cl.³ C23F *11/18*; C09K *3/00*
U.S. Cl. 253—389 R **10 Claims**

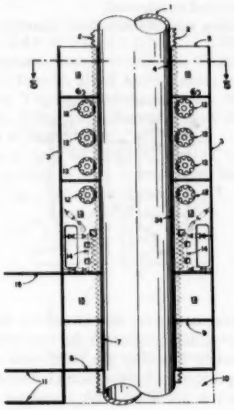
1. A composition comprising:
(a) one or more inorganic acid components of molybdic acid or its alkali salt, tungstic acid or its alkali salt, or the alkali salt of nitrous acid;
(b) an aliphatic hydroxycarboxylic acid or aliphatic dicarboxylic acid having up to seven carbon atoms or salt thereof;
(c) an inorganic heavy metal compound selected from the group consisting of the sulfate, the chloride, the nitrate and the sulfanate of zinc, manganese, tin, and, nickel, and mixtures thereof, which can readily release a heavy metal ion in water; and
(d) a water-soluble polymer component having a molecular weight in the range of 500 to 100,000 of a homo- or copolymer of acrylic acid, methacrylic acid or maleic acid; or a copolymer of any said three monomers with other copolymerizable compounds having an ethylenic double bond; or a mixture of said homocopolymer and copolymer; the weight ratio of components a:b:c:d: being about 1:0.2–30:0.1–5:0.1–5.

4,512,553

JACK-UP UNIT

David A. Dunham, New Orleans; Robert P. Riggs, Luling, and Rufus L. Burton, Jr., New Iberia, all of La., assignors to Red Fox Industries, Inc., New Iberia, La.

Filed Mar. 17, 1982, Ser. No. 358,920
Int. Cl.³ B66F *7/12*
U.S. Cl. 254—89 R **5 Claims**



1. A Jack-Up Unit for use in a body of water, comprising:

a floatable hull;

a plurality of legs, said legs suitable for contacting a solid surface and for supporting said hull in an elevated position relative to the surface of said body of water, each of said legs including at least one longitudinally extending leg gear rack;

means for moving said hull longitudinally relative to said legs for establishing said hull at a desired height relative to said legs;

a guidance system on each leg for said moving means, comprising,

an upper guide member configured to surround said leg at a close tolerance interval, and

a lower guide member configured to surround said leg at a close tolerance interval; and

a plurality of gear rack sections located one proximate each leg intermediate said upper guide member and said lower guide member, each gear rack section movable into and out of toothed engagement with said leg gear rack section on its respective leg, said toothed engagement including a gear tooth backlash in excess of said close tolerance between said upper and lower guide members and said leg whereby said engagement of said gear rack section and said leg gear rack is vertically load bearing yet horizontally pliable.

4,512,554

LEVERING TOOL FOR MANHOLE COVER

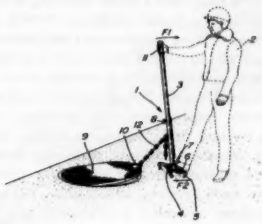
Jacques Racine, Charlesbourg, Canada, assignor to Hydro-Quebec, Quebec, Canada

Filed Mar. 18, 1983, Ser. No. 476,816
Claims priority, application Canada, Dec. 21, 1982, 418234
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—131 **11 Claims**

1. A levering tool useful in displacing an object, such as a manhole cover, out of or onto its housing at substantially ground level and permitting said object to be dragged over a distance sufficiently long whereby the object can be pulled over obstacles in the environment of the housing comprising:

a base provided with anti-skidding elements in a lower surface thereof and a foot receiving upper surface onto which the user can stand to provide a restraining load on said base; said anti-skidding elements being a series of plates of a substantially similar dimension and disposed parallel to one another and secured to said base, each plate of said series of plates lying at an angle of about 15° from a vertical axis;

an elongated and rigid power bar having a lower end mounted for pivotal movement on said base and an upper end of said power bar being free for movement along an arc in a predetermined direction, said upper end defining a hand gripping end so that a person can effect said pivotal movement by pulling said power bar from said upper end;



a link of appropriate resistance connectable between said power bar and said object;

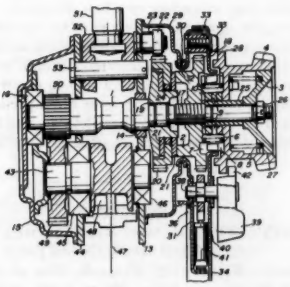
connecting means firmly connecting said object to be displaced to said power bar through said link whereby a hand pulling force applied on said upper end of the power bar causes outward displacement of said object out of the housing by straining said link with said anti-skid base remaining substantially stationary whether on hard or soft surfaces such as concrete, asphalt, loose soil, grass, ice or snow.

4,512,555

IDLING DEVICE FOR LEVER HOIST

Takayoshi Nakamura, Atsugi, Japan, assignor to Kabushiki Kaisha Kito, Yamanshi, Japan

Filed Jun. 24, 1983, Ser. No. 507,384
Claims priority, application Japan, Jul. 2, 1982, 57-113927
The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.
Int. Cl.³ B66F *19/00, 3/30;* G05G *1/12;* F16D *13/42*
U.S. Cl. 254—350 **10 Claims**



1. An idling device for a lever hoist including a change gear provided on a driving member threadedly engaged on a driving shaft for driving a sheave winding up thereabout a chain, rope or the like for a load, an operating lever rockable about said driving member by a hand, a winding-up driving pawl

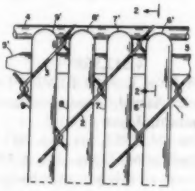
engageable with teeth of said change gear and driven by said operating lever in a winding-up direction for the load, and a braking assembly preventing said change gear from being driven from a side of said sheave and being clamped and released by rotative movement of said driving member relative to said driving shaft, said device comprising an anchoring member fixed to an end of said driving shaft on an opposite side of said braking assembly with respect to said driving member, a manually operatable knob arranged between said driving member and said anchoring member and fitted rotatably and axially slidably on said driving shaft relative thereto, a brake releasing torsion spring arranged between said manually operatable knob and said anchoring member to rotate said manually operatable knob into a brake releasing direction relative to said driving shaft, a brake clamping torsion spring arranged between said driving member and said manually operatable knob to rotate said driving member into a brake clamping direction relative to said manually operatable knob, engagement protrusions formed in said driving member and said manually operatable knob, respectively, and engaging with each other by urging by said brake clamping torsion spring to couple said driving member and said manually operatable knob, brake clamped position holding means for preventing said driving member from rotating into a brake releasing direction when said braking assembly is clamped, and brake over-released preventing means for preventing said driving member from further rotating into said brake releasing direction when said braking assembly is suitably released.

4,512,556

SLAT RETAINING MEANS FOR CHAIN LINK FENCES

Don A. Meglino, 85 Edwards St., Roslyn Heights, N.Y. 11577

Filed Feb. 6, 1984, Ser. No. 577,216
Int. Cl.³ B21F *27/00*
U.S. Cl. 256—34 **4 Claims**



1. Slat retaining means for chain link fences of the type made of linking wires comprising:

a plurality of parallel slats woven through the wires the parallel slats extending in a first direction,

a rectangular aperture in each parallel slat and

a connecting member of complimentary rectangular cross-section along its length inserted through said rectangular apertures to lock the parallel slats in position,

wherein the rectangular apertures are a predetermined distance from one end of the parallel slats and the connecting member is adapted to be secured to a vertical fence support.

4,512,557

APPARATUS FOR PREPARING HIGH-MELTING-POINT HIGH-TOUGHNESS METALS

Etsuji Kimura; Katsumi Ogi; Kazusuke Sato, all of Saitama, and Mayuki Hashimoto, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,934
Claims priority, application Japan, Jul. 21, 1982, 57-125870; Mar. 4, 1983, 58-034488
Int. Cl.³ C22B *53/00*
U.S. Cl. 266—171 **14 Claims**

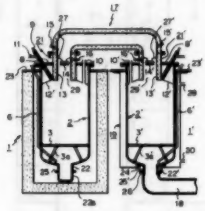
1. An apparatus for preparation of high-melting-point high-toughness metals by reduction of halide thereof with an active metal, comprising:

a heatable reaction chamber in which a metal halide and an active metal are reacted, and the remaining active metal and produced active metal halide are vaporized;

means for heating said reaction chamber;

a coolable condensation chamber in which vapors of the remaining active metal and produced active metal halide are collected and condensed;

means for cooling said condensation chamber; and



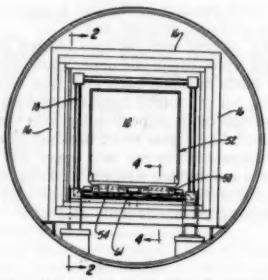
a gas passage connecting the two chambers, the whole apparatus being evacuable, wherein the reaction chamber and the condensation chamber are positioned side-by-side in the upright position, wherein each chamber has a lid with a neck which is provided with a seal pot comprising a funnel member and a pan member receiving the lower pipe of the former and a neck heating means for heating the neck, and wherein the necks of the two chambers are communicated with a detachable connecting duct provided with a duct heating means.

4,512,558

COFFIN DELIVERY SYSTEM FOR METALLURGICAL FURNACE

Roy C. Lueth, St. Clair, Mich., assignor to Ultra-Temp Corporation, Mt. Clemens, Mich.

Filed Jan. 3, 1984, Ser. No. 567,769
Int. Cl.³ C21D *1/00*
U.S. Cl. 266—249 **9 Claims**



1. A delivery system in conjunction with a high temperature metallurgical furnace having an elongated furnace chamber with a bottom, top and two sides, said top, sides and bottom each comprising an insulating panel, said panel closing said chamber, and access means at at least one end of said chamber, a coffin delivery system comprising:

a coffin having a bottom and adapted to carry parts,

a plurality of roller assemblies, each roller assembly having an axle and a roller rotatably mounted to aid axle, said roller assemblies being constructed of a high temperature deformation resistant material,

means for securing said roller assemblies to the bottom of

and within the furnace chamber so that the axles of said rolers extend transversely with respect to the axis of the furnace chamber whereby said rollers frictionally engage the bottom of said coffin and guide the coffin into the furnace chamber, and

wherein said roller assemblies are wholly contained within said furnace chamber.

4,512,559

LEAF SPRING CONSTRUCTION

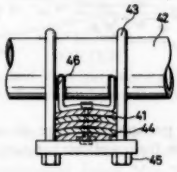
Shigetsune Aoyama; Kazuo Yoshikawa; Yoshimichi Hasegawa, and Junichi Higuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi; Aichi Steel Works, Ltd., Tokai and Chuo Hatsujyo Kabushiki Kaisha, Nagoya, all of, Japan

Continuation of Ser. No. 256,784, Apr. 23, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 518,766

Claims priority, application Japan, May 1, 1980, 55-58526

Int. Cl.³ F16F *1/18*

U.S. Cl. 267—47 **10 Claims**



1. A leaf spring for use in a laminated leaf spring comprising:

a spring steel plate having a length greater than the width thereof and being mounted to undergo bending deformation in a direction perpendicular to the length thereof, said bending deformation defining a tension side and a compression side for said plate;

said steel plate having an arcuate shape in the transverse cross-section with a convex surface on said tension side thereof and a concave surface on said compression side thereof, said arcuate shape being uniform along the length thereof and said concave and convex surfaces respectively being defined by an arc of substantially constant radius over the entire width thereof; and

said steel plate having in said cross-section a width b and a transverse center line forming an arc of a radius r_c with the relation of

$$2.0 \geqq r_c/b \geqq 0.65,$$

thereby shifting the neutral axis in cross-section toward said convex surface so as to reduce tensile stresses during bending of said leaf spring and so as to improve both flexural rigidity and fatigue strength per unit weight of said leaf spring.

4,512,560

APPARATUS FOR MOUNTING RAILS ON A RIGID RAIL BEAM

Peter Mölzer, Ebersberg; Jürgen Pollner; Nicola Topic, both of Munich; Gregor Trummer, Aschering, and Rudolf Zurek, Gröbenzell, all of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,425

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139636

Int. Cl.³ B25B *11/02*

U.S. Cl. 269—20 **14 Claims**

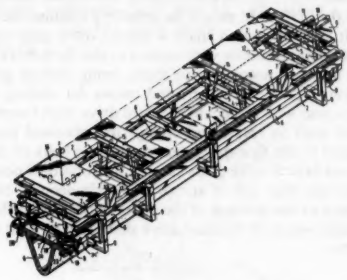
1. An apparatus for mounting relatively small and deformable elongated rails on a relatively large, generally horizontal, and nondeformable elongated rail beam, the apparatus comprising:

a stiff but limitedly elastically deformable elongated jig;

means including a plurality of clamps spaced longitudinally along the jig and engageable with the beam for locking onto the beam at respective longitudinally spaced locations;

means including respective vertical jacks and nonvertical jacks transversely engaged between the clamps and the jig for elastically deforming the jig into a desired shape relative to the rail beam; and

mounting means on the jig for securing the deformable rails to the jig in predetermined positions relative to the rail



beam, said jig including horizontal, generally parallel, and transversely spaced longitudinal frame members and horizontal and longitudinally spaced transverse frame members transversely bridging the longitudinal frame members, said clamp means including:

respective horizontal and transverse clamp beams at the locations,

respective jaws on the beams, and

respective hydraulic actuators for locking the jaws on the rail beam at the respective locations and thereby solidly arresting the transverse beams on the rail beam at the respective locations.

4,512,561

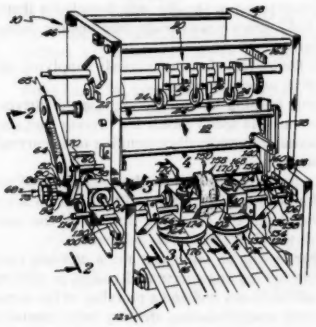
FOLDER UNIT WITH MEANS FOR SIMULTANEOUS PHASE SHIFTING OF FRONT AND REAR SPIRAL SETS

Frank Ury, St. Croix Falls, Wis., assignor to Brandtjen & Kluge, Inc., St. Croix Falls, Wis.

Filed May 15, 1984, Ser. No. 610,503

Int. Cl.³ B41L *1/30*

U.S. Cl. 270—40 **19 Claims**



7. In a folder unit for folding a continuous web of paper having cross perforations including a front set of spirals driven by a first shaft having a first end and a second end, a rear set of

spirals driven by a second shaft having a first end and a second end, with the first shaft being in a parallel spaced relation to the second shaft, a paper chute pivotal between a first position for directing the paper web towards the front set of spirals and a second position for directing the paper web towards the rear set of spirals and a first drive gear in a rotatable relation with the position of the paper chute, wherein the improvement comprises means for driving the first and second shafts together and for allowing the simultaneous phase shifting of the first and second shafts with the position of the paper chute, with the phase shifting and driving means comprising, in combination: a third drive shaft extending between the first and second shafts; means for rotatably relating the third drive shaft and the first shaft; means for rotatably relating the third drive shaft and the second shaft; a second drive gear rotatably related to but slideable with respect to the third drive shaft; with the first and second drive gears being helical gears and in gearing relation together; and means for sliding the second drive gear with respect to the third drive shaft forcing the third drive shaft to rotate and change its rotational position with respect to the first drive gear due to the helix of the first and second helical drive gears causing the rotational position of the front and rear sets of spirals to simultaneously change with respect to the position of the paper chute due to the rotatably relating means of the third drive shaft with the first and second shafts.

4,512,562

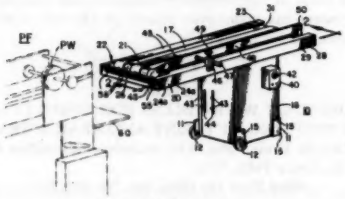
FEEDER TABLE WITH PHOTO-SCAN CONTROLLED BELT MOTOR

Richard J. Moll, c/o Dick Moll & Sons, 415 Constance Dr., Warminster, Pa. 18974

Continuation-in-part of Ser. No. 138,713, Apr. 9, 1980, abandoned. This application Jun. 18, 1984, Ser. No. 621,533

Int. Cl.[3] **B42C** *1/00*

U.S. Cl. 270—45 **7 Claims**



1. In combination with a pile fed paper folding machine for folding sheets of paper or the like, which includes sheet pick up means, and hold down means on the machine the improvement which comprises

a portable feeder table for continuously supplying said sheets for folding which includes

a portable housing having therein a motor driven shaft,

a single variable speed motor for driving said shaft,

a horizontal longitudinally extending table carried by said housing,

height adjusting members on the lower part of said housing for adjusting the height of the table to accord with the height of the receiving portion of the machine to which the sheets are to be delivered,

said table having an input end and a delivery end,

said table having transverse end rollers at said input end and said delivery end and a plurality of flat horizontally disposed spaced endless driving belts carried on said rollers and longitudinally movable along said table,

said motor driven shaft being connected in driving relation to said roller at said delivery end,

said table having along one side edge thereof a longitudinally extending movable guide plate for one side edge of the sheets to be advanced,

said table having at the delivery end a transversely extending nose plate, and

detector means responsive to the presence or absence of a pile of paper sheets for controlling the operation of said motor and the advance of sheets to said folding machine for folding.

4,512,563

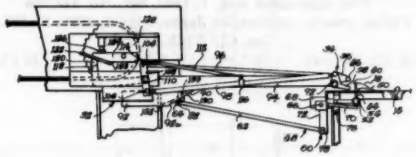
TAKEOFF METHOD AND APPARATUS

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Oct. 26, 1982, Ser. No. 436,833

Int. Cl.[3] **B65H** *29/10*

U.S. Cl. 271—85 **12 Claims**



1. Apparatus for transporting large sheets of stock which may have curled ends from a planar support surface to another location, comprising:

a stationary screen printing frame having a pivotally mounted printing head,

a stationary, planar support surface for supporting a sheet of stock at a fixed planar location thereon beneath said printing head,

gripper means for gripping a sheet of stock and transporting it, the gripper means comprising a plurality of grippers having upper and lower jaws movable between an open position for receiving a sheet of stock and a closed position for gripping a sheet,

means for opening and closing the gripper jaws,

carriage means mounted on the frame for transporting the grippers and a sheet gripped from the stationary planar support surface thereby to another location, and

lifting means mounted on the stationary frame including pins for raising a leading end of the sheet of stock upwardly above the stationary, planar support surface and including a mechanical operated means actuated by said carriage means to lift said pins to ensure that the jaws of the grippers grip sheets of stock having curled ends.

4,512,564

PULLOUT ROLLER ASSEMBLY

Ronald W. Alverth, Lombard, and Thomas H. Schumacher, West Chicago, both of Ill., assignors to The Mako-Tek Corporation, Downers Grove, Ill.

Filed Dec. 19, 1983, Ser. No. 562,854

Int. Cl.[3] **B65H** *5/06*

U.S. Cl. 271—274 **11 Claims**

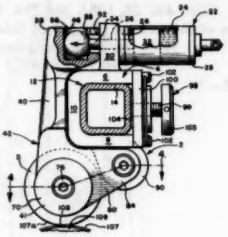
1. In a printing press comprising frame means supporting a plurality of imprinting stations and means for drawing imprintable stock through said stations comprising stock-grasping and pulling roller means mounted on said frame means

said roller means comprising a first roller rotatable about a fixed axis,

a second roller,

means mounting said second roller for adjustment about a single universal axis defined between a point of contact of an associated biasing means, and a point at the center of a cross section of the second roller for automatically adapting said second roller to position itself to rotate about an axis parallelling said fixed axis of said first roller, and

rigid non-binding load transfer means having a single point of contact with said mounting means for biasing said second roller toward the fist roller and providing an axis

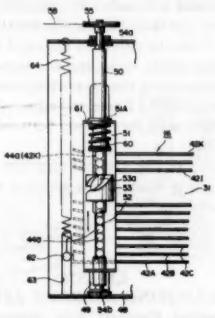


of pivot for said mounting means about said universal axis without inhibiting self-adjustment thereof for grasping said stock therebetween.

4,512,565
SORTER

Hiroshi Matsumoto, and Yoshiaki Nawata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 361,103, Mar. 23, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,011
Claims priority, application Japan, Mar. 30, 1981, 56-46740
Int. Cl.[3] B65H *31/24*
U.S. Cl. 271—294 **11 Claims**



1. A sorter, electrically and mechanically connected to a copying machine main body, said sorter comprising:

reset signal generating means for generating a reset signal synchronously with the entry of a change in a preset copying sheet number by an operator;

sorting means including plural sort bins defining plural sort bin positions, a first sort bin at one end of said plural sort bins establishing a first sort home position and a last sort bin at an opposite end of said plural sort bins establishing a second sort home position, said sorting means for sorting copied paper sheets being fed out of said copying machine main body and into said sort bins alternately and repetitively in forward and reverse directions starting from either said first or second sort home positions; and

control means operatively connected to said sorter means and said reset signal generating means for stopping said sorting means and thus stopping the sorting of said copied sheets at a respective one of said bin positions corresponding to said preset copying sheet number in response to the number of copied sheets being equal to said preset copying sheet number; and for either (a) resuming the sorting of said copied sheets beginning with said respective one sort bin position in the absence of said control means receiving said reset signal, or (b) resuming the sorting of said copied sheets by said sorting means beginning with either said first or second sort home positions in response to said control means receiving said reset signal indicative of a change in said preset copying sheet number.

4,512,566
AUDIO-VISUAL DEVICE FOR GYMNASTIC IMPLEMENTS

Eugenio Bicocchi, Via Leopoldo Nobili, 10, Reggio Emilia, Italy

Continuation-in-part of Ser. No. 101,907, Dec. 10, 1979, abandoned. This application Nov. 12, 1982, Ser. No. 441,236
Claims priority, application Italy, Dec. 13, 1978, 46918 A/78
Int. Cl.[3] A63B *69/16*
U.S. Cl. 272—72 **18 Claims**

1. An exercise machine comprising:

a movable member moved by the user during exercise;

an audio-visual device visible to said user and provided with a picture or feeding image device;

an external source of current for supplying electrical energy to said audio-visual device;

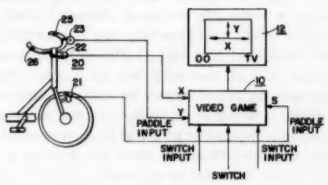
power source means for sensing the speed of said movable member is a user powered generator comprising a sprocket applied to a flywheel of said exercise machine, a stepless speed-change gear connected through a worm gear-helical wheel coupling a flexible cable to said sprocket, and a film drawing sprocket connected to said stepless speed change gear; and

switch means for connecting said picture or image feeding device to said external source of current or to said power source means for sensing the speed of said movable member.

4,512,567
EXERCISE BICYCLE APPARATUS PARTICULARLY ADAPTED FOR CONTROLLING VIDEO GAMES

Robert V. Phillips, 113 High St., South Bound Brook, N.J. 08880

Filed Mar. 28, 1983, Ser. No. 479,511
Int. Cl.[3] A63B *69/16*
U.S. Cl. 272—73 **9 Claims**



1. An exercising apparatus for controlling a video game apparatus, said game of the type having input terminals for

receiving electrical type signals necessary to control the movement of a particular object associated with a video game as displayed on the screen of a television receiver associated with said video game apparatus, comprising in combination therewith,

an exercise bicycle having a frame and having a pedal driven wheel and a moveable handlebar assembly which assembly is pivotally coupled to said frame to move in a right or left direction as well as move up or down,

first means coupled to said handlebar assembly to provide a first output signal indicative of the extent of motion of said assembly in said right or left direction to provide control of the movement of said object in the horizontal plane,

Second means coupled to said handlebar assembly to provide a second output signal indicative of the extent of motion of said assembly in said up or down direction to provide control of the movement of said object in the vertical plane,

third means coupled to said wheel to provide a third output signal indicative of the speed of the wheel to provide control of the speed of said object as moving in said horizontal or vertical planes, and

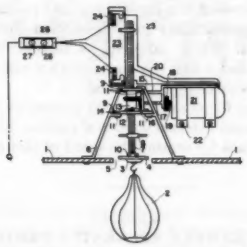
means adapted to apply said first, second and third output signals to associated input terminals of said video game apparatus whereby said object can be controlled to move about said screen according to said output signals.

4,512,568

PUNCHING BAG REBOUND ADJUSTER

Robert Servadio, 3721 Parkview Ave., Pittsburgh, Pa. 15213

Filed Apr. 4, 1983, Ser. No. 481,732
Int. Cl.³ A63B *69/22*
U.S. Cl. 272—78 **1 Claim**



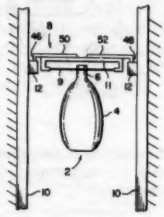
1. In combination with a rebound board, having a central hole, a punching bag, mounting means including mounting legs supported on said rebound board and surrounding said central hole, for suspending said punching bag from said rebound board through said central hole, including adjusting means comprising a vertically mounted threaded shaft, from the lower end of which said punching bag is suspended, coaxially with said shaft, said hole being sufficiently large to allow the top portion of said punching bag to project therethrough, reversible driving motor means, including control buttons and circuit breakers mounted on a panel supported on said mounting means and responsive to a trip lever propelled along said vertically mounted threaded shaft for driving a bevel gear internally screw threaded to said vertical shaft to effect selective lifting or lowering of said vertical shaft in response to rotation of said driving motor means in one direction or in an opposite direction to adjust the distance between the rebound board and punching bag.

4,512,569

PUNCHING BAG APPARATUS AND ADJUSTABLE SUPPORTING MEANS

Louis Aragona, 11 Scheiber Ter., Cedar Grove, N.J. 07009

Filed Jul. 25, 1983, Ser. No. 516,582
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Int. Cl.³ A63B *69/22*
U.S. Cl. 272—78 **6 Claims**



1. Punching bag apparatus and supporting means, comprising:

a punching bag member having a body portion adapted for being struck by a user and a neck portion adapted for engaging a supporting member;

the supporting member including a pair of elongated wire-like members which are twisted together to form a centrally disposed resilient portion for engaging the neck portion of the punching bag member so that said member offers resistance when the body portion thereof is struck by the user and automatically snaps back to the rest position, one of said wire-like members extending in opposite directions from the centrally disposed resilient portion;

the supporting means including the supporting member, a frame for supporting the supporting member, and a pair of arms mounted to the frame and adjustable relative thereto in accordance with the spacing between a pair of vertical members; and

means mounted to the vertical members for receiving the adjusted arms to retain the supporting means between the vertical members.

4,512,570

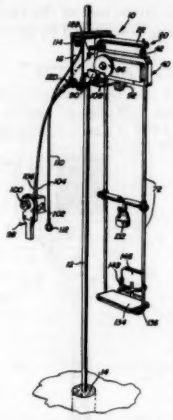
ROPE CLIMBING EXERCISE APPARATUS

Georges M. Tardivel, Flagstaff, Ariz., assignor to Monique M. Tardivel, Venice, Calif.

Filed Feb. 17, 1983, Ser. No. 467,852
Int. Cl.³ A63B *7/04*
U.S. Cl. 272—112 **12 Claims**

1. A rope climbing apparatus including support structure for support in elevated position above a support surface from which a user of the apparatus may be supported, an elongated section of flexible tension member, said support structure including tension member support and guide means supporting and guiding said tension member from said support structure for longitudinal shifting relative thereto and with a portion of the tension member depending downwardly from said support structure, said support and guide means including adjustable brake means variably braking said tension member against longitudinal shifting relative to said support and guide means, said brake means including remotely controllable adjustment means incorporating an adjustably shifting control member and elongated flexible connecting means connecting said control member and said brake means for adjustment thereof from said remote adjustment means, an inverted L-shaped support arm structure including an upper horizontal arm portion and a vertical arm portion depending downwardly from one end of

said horizontal arm portion, means oscillatably supporting said vertical arm portion from a suitable support for angular displacement about its longitudinal axis, said support structure being removably supported from said horizontal arm portion.

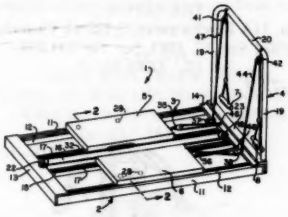


4,512,571

FORCE OPPOSITION TYPE EXERCISER

Victor M. Hermelin, 13547 Ladue Farm Rd., St. Louis, Mo. 63141

Filed Sep. 30, 1982, Ser. No. 429,688
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—126 **5 Claims**



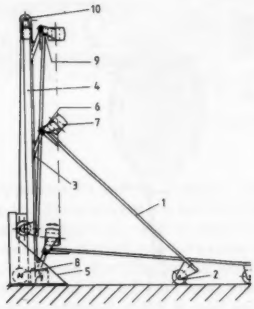
1. An resistance exercise machine wherein member is pitted against member, said machine comprising a frame including a horizontal reach and an upright, and four interconnected but separate movable stations, two mounted on said horizontal reach to accommodate the feet of the user and adapted to be stood upon and two, carried above said horizontal reach by said upright, to accommodate the hands of the user; a first, two-ended, elongated flexible means connected at one end to one hand station, passing through means supported by said upright for changing the direction in which said flexible means tends and connected at its other end to one foot station for transmitting force to move said foot and hand stations in opposite directions in response to the exertion by the user of a preponderant force on one of said hand and foot stations; a second, two-ended, elongated flexible means connected at one end to the other of said hand stations, passing through means supported by said upright for changing the direction in which said flexible means tends and connected at its other end to the other of said foot stations for transmitting force to move said foot and hand stations in opposite directions in response to the exertion by the user of a preponderant force on one of said hand and foot stations, and third means interconnecting said separate foot stations for transmitting force to move said stations in opposite directions in response to the exertion by the user of a preponderant force on one of said foot stations, said hand stations being interconnected mediately and only through said third means.

4,512,572

MULTI-PURPOSE SPORTS-KIT

Wilfried Hamm, Im Wiesengrund 28, 4330 Mulheim-Ruhr, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,350
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 8231535[U]
Int. Cl.³ A61F *5/00*
U.S. Cl. 272—144 **8 Claims**



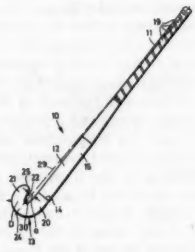
1. An exercising apparatus comprising in combination, a support base adapted to stand on a horizontal floor, said base defining an inclined ramp surface and a vertically upwardly extending post, a carriage slidably mounted on said support post, powered means for raising and lowering said carriage, a bed having one end pivotably mounted to said carriage, rollers at the opposite end of said bed and adapted to roll across the floor adjacent said support, and clamping devices to hold a persons feet at said one end of said bed, said one end when raised in response to raising said carriage causes the rollers to move across the horizontal floor and to ride up said ramp to support the person from said clamping devices so that he is suspended generally vertically in addition to being supported in intermediate inclined positions.

4,512,573

HOCKEY STICK HAVING A U-SHAPED HEAD

Toon Coolen, CT Nuenen, Netherlands, assignor to Grays of Cambridge (Pakistan) Limited, Pakistan

Filed Feb. 15, 1983, Ser. No. 466,587
Int. Cl.³ A63B *59/12*
U.S. Cl. 273—67 A **6 Claims**



1. A hockey stick having a shaft and a head, the head being

provided at one end of the shaft and being in the form of a U-shaped member having two limbs and a base interconnecting the limbs, one limb of the head having a free end portion and the other limb of the head having an end portion forming an axial continuation of the said one end of the shaft, the distance between the said limbs being less than the diameter of a standard size hockey ball and the said limbs and base together providing a ball-striking face.

4,512,574

RACKET HAVING A REFRIGERANT CONTAINED THEREIN FOR HEAT DISSIPATION

William J. Klaila, 399 Marion Rd., Middleboro, Mass. 02346

Filed Sep. 20, 1982, Ser. No. 419,777
Int. Cl.³ A63B *49/00*
U.S. Cl. 273—73 J **8 Claims**

2. A hand held device for dissipating body heat, said device comprising:

(a) a frame having a handle;

(b) at least one tubular member disposed about portions of said frame, said tubular member extending into said handle; and

(c) a refrigerant within said tubular member, said tubular member defining an evaporator and a condenser.

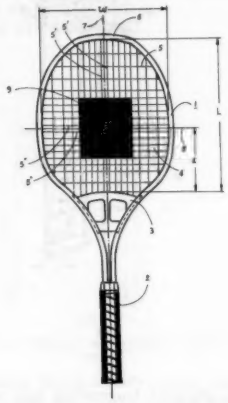
4,512,575

RACQUET HAVING STRINGS OF EQUAL LENGTH

Kuo-Nan Tzeng, No. 35-4, Sec. 3, Chinan Rd., Taipei, Taiwan

Filed Nov. 30, 1982, Ser. No. 445,737
Int. Cl.³ A63B *49/02*
U.S. Cl. 273—73 D **3 Claims**

1. A tennis racquet comprising a frame, a handle and a throat, the throat being secured within the frame to define a strung surface therewith, said frame comprising a frame tip located opposite said throat, said frame tip and throat having inner edges defining the boundaries of said strung surface in a longitudinal direction, said frame further comprising two sides oppositely arranged, said two sides having inner edges defining the boundaries of said strung surface in a transverse direction, said strung surface having a stringing pattern comprising a pair of longitudinal central strings located symmetrically one on each side of a central longitudinal axis of the frame, four additional strings disposed outwardly of each of the central strings to make ten longitudinal strings and a plurality of strings disposed outwardly of said ten longitudinal strings; a pair of transverse central strings located symmetrically one on each side of an axis extending in the transverse direction of the frame, said last named axis being located at a distance approximately 40% of the length of said strung surface as measured from the inner edge of the throat to the tip of the frame, and both in directions toward the tip of the frame and toward the throat, four additional strings being arranged to make ten transverse strings, there being as well a plurality of strings on either side of said ten transverse strings, the total number of the last named plurality of strings on the frame tip side of the racquet being no more than the number of the last named plurality of strings on the throat side of the racquet, plus one; an effective strike area being constituted by the cross-linking of



said ten longitudinal and ten transverse strings, and corresponding to the scope of said area the inner edges of the frame tip and of the throat being parallel and of an identical curvature, said curvature of said inner edge of the throat facing said area being of convex shape, and the inner edges of both sides of the frame being arranged at a minimum curvature.

4,512,576

STRUNG RACKET AND TENSION ADJUSTING DEVICE THEREFOR

Lars Dahlgren, 11A Klockargatan, S-723 44 Västerås, Sweden

Filed Sep. 12, 1983, Ser. No. 531,035
Int. Cl.³ A63B *51/12*
U.S. Cl. 273—73 R **10 Claims**

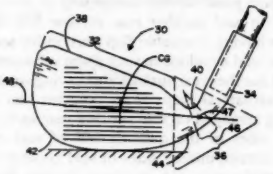
1. The combination of a racket and a device for attachment to and to remain attached to said racket during play, said racket comprising a frame with interwoven longitudinal and transverse strings strung thereacross to form a planar playing surface;

said device providing a means for adjusting the tension of said strings and comprising: a first elongated part being generally U-shaped in a transverse cross-section and providing spaced apart edges for contact with said strings, the area between said spaced apart edges defining an open mouth; said device further comprising a second part having a length substantially equal to the length of said first part and a width less than the distance between the edges of said first part and means for securing said first and second parts together on opposite sides of said planar playing surface and in contact with said strings;

said securing means providing a varying degree of penetra-

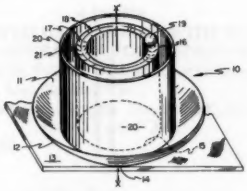
tion by said second part into the open mouth of said U-shaped first part so as to adjust the tension of the strings of the racket.

4,512,577
SET OF GOLF CLUBS
Karsten Solheim, 501 Wakonda La., Phoenix, Ariz. 85023
Continuation of Ser. No. 412,910, Aug. 30, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 620,521
Int. Cl.³ A63B *53/04*
U.S. Cl. 273—77 A **1 Claim**



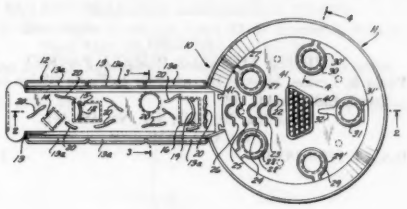
1. In a set of correlated iron-type golf clubs, the head of each club having a main body, a hosel for receiving a shaft, and a neck connecting said hosel to said main body, said main body having a face for striking a ball, a sole, a toe, and an upper edge inclined upwardly from said neck to said toe, an improvement comprised of a shape for said neck defined by a smooth convex curve, as viewed from the face, of approximately constant radius over a sector extending from said sole to said hosel, and a sharper concave curve of shorter radius extending up to said hosel over a smaller sector approximately centered on the sector of said smooth curve of greater radius to define a neck having at its mid-cross section a maximum dimension which is smaller than the diameter of said hosel at the lower end of said hosel where it connects to said neck, whereby said neck uncouples the twisting action of said club head from said shaft.

4,512,578
BALL AND TRACK GAME
Susan H. Dalton, 331 West 1200 North, Orem, Utah 84057
Filed Dec. 9, 1983, Ser. No. 559,944
Int. Cl.³ A63B *67/08*
U.S. Cl. 273—110 **7 Claims**



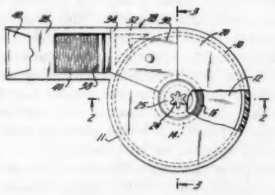
1. A ball and track game comprising:
a truncated spheroidal-shaped base member having a convex under face by which said device can contact and rest upon a support surface;
a centrally located elongated vertical support secured by one of its ends to the surface of the concave upper face of said base member, said elongated vertical support and said base member having corresponding axes;
at least one closed-end, generally circular track attached to the other end of said elongated vertical support, said track being adapted to receive and have move therein a ball or other spheroidal object;
a sleeve concentric with and fitted about said elongated vertical support thereby providing an annular space therebetween, said sleeve being secured by one of its ends to the bottom of the concave upper face of said base member and terminating at its other end at approximately the plane of the track surface of said tubular cannister.

4,512,579
GAME WITH MARBLE AGITATION
Eddie L. Clipper, 152 Macon St., Brooklyn, N.Y. 11216
Continuation-in-part of Ser. No. 427,552, Sep. 29, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,465
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—123 R **4 Claims**



1. A game apparatus for use with marbles which are shot from a starting line down toward a score line, comprising an elongated launching pad, a plurality of obstacles placed randomly on said pad, a pan portion coupled to said launching pad portion for receiving the marbles shot successfully over said lauching pad portion and a plurality of score marking barriers arranged in a predetermined order in said pan portion for assigning score numbers or priorities for further playing the marbles landing at the various score barriers, wherein said launching pad portion is an elongated handle-shaped member having said plurality of obstacles in the form of a first-type of obstacles for deflecting the marbles into a second plurality of obstacles in the form of receptacles, wherein said pan member comprises a plurality of said score marking barriers arranged in a predetermined order of difficulty and carrying a predetermined number of assigned value according to the difficulty of landing the marbles into said score marking barriers, and further including a plurality of additional score means in the form of a stack of marbles marked for shooting by the highest scoring player into receptacles provided in said pan area, wherein one of said receptacles has an ascending ramp member associated therewith and a basket shaped receptacle formed at a predetermined height above said ramp and containing a special marble awarded to the player for a marble shot up the ramp and into the associated receptacle.

4,512,580
DEVICE FOR REDUCING PREDICTABILITY IN CARD GAMES
John Matviak, R.R. #1, Box 221, Bloomsbury, N.J. 08804
Filed Nov. 15, 1982, Ser. No. 441,917
Int. Cl.³ A63F *1/12*
U.S. Cl. 273—148 A **16 Claims**



1. A device for maximizing the random distribution of a plurality of playing cards, said device comprising a base, a

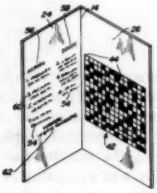
continuous, advancable, circular track rotatably mounted on said base, means disposed on said track operable to support a plurality of unpartitioned cards only at their edge portions radially on said track with their major surface in a vertical orientation, and a cover associated with said base, said base and cover operable cooperatively to enclose said track and cards supported thereon, and said cover further defining at least one sectorially shaped access station permitting either or both of manual removal of an arbitrary number of the cards on that segmental region of the track then aligned with the access station or manual insertion of cards into that segmental region of the track then aligned with the access station.

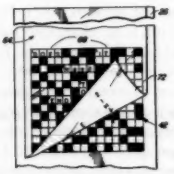
4,512,581

HIDDEN MESSAGE PUZZLE PACKET

Paula B. Levine, Skokie, Ill., assignor to Paula Blaine International, Ltd., Skokie, Ill.

Filed Jan. 20, 1983, Ser. No. 459,381
Int. Cl.³ A63F 9/06
U.S. Cl. 273—153 R **1 Claim**





1. A puzzle-presenting message greeting card comprising:

a support panel for carrying imprinted reference indicia thereon;

a lattice-like pattern imprinted on said support panel on one surface face thereof, said pattern having a plurality of reference numbers imprinted thereon at spaced, selectable loci of said pattern;

a cover panel having substantially the same quadrilateral shape and approximately the same dimensions as said support panel, said support panel and said cover panel each having a side edge thereof fixedly and pivotally connected to the side edge of the other of said support panel and said cover panel to form an openable greeting card, such that, when said card is opened, said pattern is visible immediately;

said cover panel having printed material on the front surface face thereof, which front surface face faces away from said support panel when said greeting is closed, such that said cover panel overlies said one surface face of said support panel, said printed material communicating an idea about the contents of said pattern;

said cover panel further comprising an array of legand means formed on the rear surface face thereof, which rear surface face faces toward said one surface face of said support panel when said greeting card is in its normally-closed position in overlying-fashion, said legand means giving instructions to fill out the lattice-like pattern of said one surface face of said support panel;

a translucent recordation sheet made of a flexible material to allow for the folding thereof, said translucent recordation sheet also having substantially the same quadrilateral shape as said support panel for fitting over said pattern; said translucent recordation sheet being positioned over said one surface face of said support panel for overlying said pattern; said translucent recordation sheet having imprinted thereon printed matter arranged such that it overlies said pattern to fill it in to give the information desired to be conveyed by said greeting card, said printed material of said recordation sheet being arranged in a manner similar to the reference numbers of said pattern.

said support panel further having another surface face constituting the rear thereof facing away from said cover panel when said cover panel overlies said support panel in a parallel-like arrangement in its normally-closed position; said support panel further comprising an envelope fixedly attached to said another rear surface face thereof, said envelope having a sealable flap portion for sealing of said envelope, said envelope having a size substantially smaller than said another rear surface and having substantially the same quadrilateral shape as said another rear surface face and being arranged on said another rear surface face such that the sides of the quadrilateral of said envelope lie adjacent corresponding sides of said another rear surface face quadrilateral; said envelope further having a size great enough to hold therein said recordation sheet when said recordation sheet has been removed from said one surface face of said support panel and has been folded; and

means for adhesively attaching said recordation sheet to said one surface face of said support panel, said means for adhesively attaching securing said recordation sheet to said support panel for easy separation thereof.

4,512,582

RING PUZZLE

Rémy Dallaire, 461 St. Isidore St. P.O. Box 95, Lac à la Croix, Canada (G0W 1WO), and Claude Larouche, 402 Desnoyers St. Apt. 8, Beauport, Canada G1E 2N3

Filed May 3, 1984, Ser. No. 606,691
Int. Cl.³ A63F 9/08
U.S. Cl. 273—158 **6 Claims**

1. In a puzzle having a plurality of post-like members and a plurality of ring-like members, said ring-like members being articulately attached adjacent the corresponding ends of respective ones of said post-like members, and an elongated closed loop-like member in interlocking engagement with the respective pairs of said post-like and ring-like members, so that the loop-like members can normally be disengaged from said post-like and ring-like members only by a series of prescribed manipulations of all of said members, said post-like members each having an opposite end movably anchored to a common base member, each post-like member being made of two parts, namely: a rod defining said corresponding end and a cap member, said cap member having a slot opening through three sides for the transverse insertion of a ring-like member into the cap slot with the ring-like member protruding from opposite two

sides of said cap member, said cap member further having a blind bore extending across the third side of said cap slot, said blind bore receiving said corresponding end of said rod, whereby said rod is attached to said cap member and locks said ring within said cap slot.

4,512,583

GOLF CLUB FOR INSTRUCTION OR RECREATION

Laurent Leveque de Vilmorin, 15 rue Pierre Lescot, Paris, France 75001

Filed Nov. 16, 1983, Ser. No. 552,536
Claims priority, application France, Nov. 17, 1982, 82 19250
Int. Cl.³ A63B *53/04*
U.S. Cl. 273—168 **17 Claims**

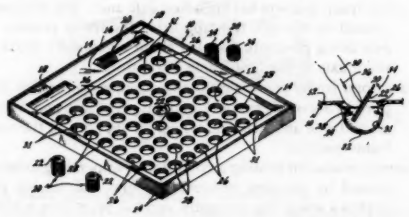
1. A golf club for instruction or recreation, comprising a shaft having one end fixedly secured to a ball striking head of generally polyhedral shape widening out from the shaft, said head having a plurality of striking faces which have different angles of inclination and can be selected by simply turning the shaft, wherein the striking head has three striking faces widening out in trihedral form from an apex on which the shaft of the club is fixed, the three faces intersecting at three edges which intersect themselves at said one end of the shaft.

4,512,584

IMPROVED GAME BOARD WITH PIECES COOPERATING FOR ROTATION

George F. Propsom, Racine, Wis., assignor to Western Publishing Company, Inc., Racine, Wis.

Filed Jun. 24, 1983, Ser. No. 507,381
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—282 **4 Claims**



1. A rectangular game board provided with a raised support along its edges,

said game board having a rectangular upper playing surface with a plurality of circular openings formed therein, each of said openings being formed as a separate deep pocket with sides and a bottom portion; and

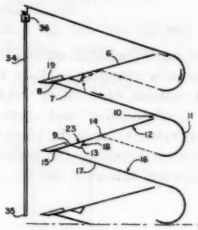
a plurality of flat circular playing chips capable of being deployed within said circular openings and resting within each of said circular openings, and means whereby, if a force is applied to any portion of the edge of a chip when supported within said opening, said chip supported in said opening will be flipped over to show the opposite side of the chip.

4,512,585

BULLET TRAP FOR A SHOOTING STAND

Marie E. Baravaglio, 5, rue des Lacs, 91350 Grigny 2, France

Filed Mar. 28, 1984, Ser. No. 594,359
Claims priority, application France, Apr. 8, 1983, 83 06395
Int. Cl.³ F41J *1/12*
U.S. Cl. 273—410 **5 Claims**



1. A bullet trap for a firing stand, comprising successions of metal sheets slanted alternately to the front and to the rear and forming a succession of dihedrons, metal sheets joined together two by two at their front end and being close to each other two by two at their rear end while being separated by a space forming a passage for the bullets, a first metal sheet out of two being extended rearwardly, beyond the passage, by a curved portion forming a deflector, the second metal sheet being interrupted at the level of the passage, the angle at the apex of the dihedrons being less than 60°, the bisecting plane of the dihedrons being parallel to the mean shooting direction and the deflector being formed by a semi cylinder connected to the corresponding first metal sheet along its tangent for deflecting the bullets and reversing their direction of travel while throwing them back against the rear face of the second metal sheet not provided with deflectors, wherein angle irons are firmly secured to the rear face of the second metal sheets parallel to the apex of the dihedrons and disposed after the line of impact of the bullets on the rear face of the metal sheets, so as to form a deflector throwing the bullets back onto the rear face of the first metal sheets.

4,512,586

SEAL WITH PREFORMED V-SHAPED PACKING RINGS AND METHOD

Russell G. Smith, Maison LaFayette, 800 Rue de LaPaix, #26, Cincinnati, Ohio 45220

Filed May 18, 1984, Ser. No. 611,993
Int. Cl.³ F16J *15/18*; B29C *17/04*
U.S. Cl. 277—124 **16 Claims**

1. A packing arrangement for sealing a pressurized fluid system, comprising:

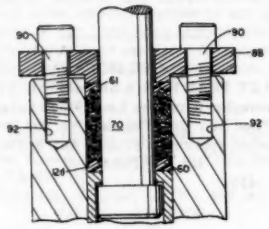
(a) a structural body;

(b) a shaft extending into said structural body;

(c) a plurality of packing rings formed from a memory retainable material, said packing rings being stacked in alignment with each other, said rings being preformed in a forming die from a substantially planar body circumferentially disposed about a centrally disposed shaft receiving aperture into a preformed V-shaped configuration with a

pair of obliquely oriented sidewalls convergingly disposed in concentric relationship to each other; and

(d) a packing chamber in said body, said packing chamber having cylindrical sidewalls in spaced concentric relationship to said shaft, said stacked packing rings being disposed in aligned compressive relationship in said chamber



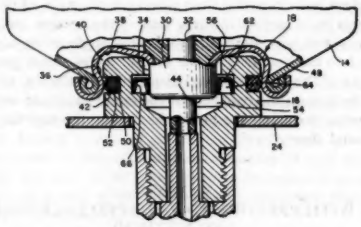
between said cylindrical sidewalls and said shaft, wherein the obliquely oriented packing ring sidewalls are compressed toward each other beyond the preformed V-shaped configuration, said memory retainable material being operative to urge the rings toward their preformed configuration whereby the sealing relationship between the cylindrical sidewalls and the shaft is enhanced.

4,512,587

AEROSOL CANNISTER FITTING

James W. Burke, Long Grove, Ill.; John D. Krueger, Brookwood, Wis., and John W. Krueger, Glenview, Ill., assignors to Krubur, Inc., Algonquin, Ill.

Filed Feb. 28, 1978, Ser. No. 882,202
Int. Cl.³ F10J *15/18*
U.S. Cl. 277—205 **19 Claims**



1. A fitting adapted to receive and seal an aerosol cannister valve assembly, said assembly having an exit port and a perimeter surface which cooperates with a floor surface to define a recess surrounding the exit port, said fitting comprising:

an annular fitting member adapted to fit into the recess; and

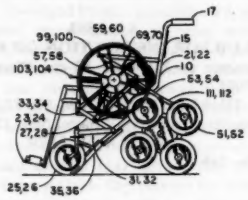
an annular sealing member disposed on the fitting member, said sealing member sized to contact both the fitting member and a portion of the perimeter surface such that the sealing member is compressed between the fitting member and the portion of the perimeter surface to provide a substantially fluid tight, static seal between the fitting member and the portion of the perimeter surface of the valve assembly.

4,512,588

STAIR CLIMBING WHEEL CHAIR

Kenneth R. Cox, 2711 Marquis Cir. E., Arlington, Tex. 76016

Filed Apr. 15, 1983, Ser. No. 485,269
Int. Cl.³ B62B *5/02*
U.S. Cl. 280—5.26 **11 Claims**



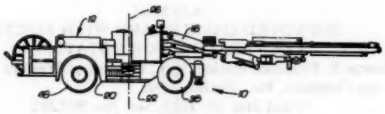
1. A self propelled vehicle adaptable to climbing stairs comprising: a cargo supporting frame, a pair of symmetrical rear suspension frames with a spider wheel rotatably attached to each, and a pair of symmetrical forward suspension frames with a sloped skid rigidly attached; with the rear suspension frames attached to the cargo supporting frame by a plurality of arms with ends rotatably attached to the cargo frame and the rear suspension frames, with the forward suspension frames attached to the cargo frame by a plurality of arms with ends rotatably attached to the cargo frame and the forward suspension frames; with rear frames and forward suspension frames containing a common attachment arm causing said frames to move in sequence with each other for respositioning the spider wheels in a forward and upward direction and skids in a forward and downward direction for traversing stairs with supporting loads carried primarily by the spider wheels.

4,512,589

OSCILLATING AXLE OVERRIDE SYSTEM

Albert R. Ambrose, Troutville, and Scott F. Fancett, Roanoke, both of Va., assignors to Cooper Industries Inc., Houston, Tex.

Filed Dec. 27, 1982, Ser. No. 453,236
Int. Cl.³ B60G *19/10*
U.S. Cl. 280—6 R **13 Claims**



1. An articulated vehicle comprising:

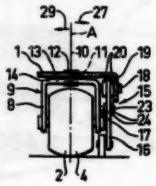
a first frame portion having a first axle and a wheel rotatably carried by the axle for supporting the frame portion, said axle being pivotally coupled about a generally horizontal pivot axis to the first frame portion;

a second frame portion pivotally coupled to the first frame portion about a generally vertical pivot axis and having a second axle and a second wheel for supporting the second frame portion;

sensor means for sensing a condition of impending imbalance caused by pivoting between the first and second frame portions about the generally vertical pivot axis while the vehicle is turning; and

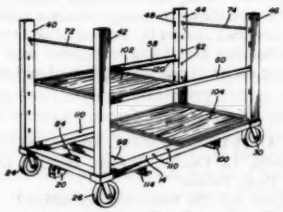
means responsive to the sensor means, for restricting the movement of the first axle relative to the first frame portion when the vehicle is in the condition of impending imbalance, thereby increasing the stability of the operation of the articulated vehicle while turning.

4,512,590
ROLLER SKATE
Carl-Johan Stenvall, Älvsbyn, Sweden, assignor to NPI New Products Investment AB, Askim, Sweden
PCT No. PCT/SE82/00122, § 371 Date Dec. 13, 1982, § 102(e) Date Dec. 13, 1982, PCT Pub. No. WO82/03560, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 14, 1982, Ser. No. 453,882
Claims priority, application Sweden, Apr. 15, 1981, 8102439
Int. Cl.³ A63C 17/06
U.S. Cl. 280—11.23 6 Claims



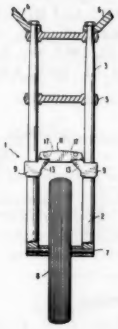
1. A roller skate comprising an elongated plate for supporting a user's foot, said plate having a front portion and a rear portion, at least one front wheel, at least one rear wheel, each wheel being rotatably mounted on a shaft and having a convex curved running surface for rolling on a sub-surface; means for pivotally connecting one of said wheels to one of said portions of said plate so that said one wheel is swivable about an axis in a longitudinal central plane through said plate; and a steering mechanism for said one wheel and comprising a sensing member for rolling on said sub-surface, and means interposed between said sensing member, said connecting means and said plate, the arrangement being such that the angle of swivelling of said wheel is determined by the inclination of the said plane in relation to the subsurface, as said member, as a result of support against the subsurface, is located at different distances from a plane at right angles to the said longitudinal plane and at a tangent to the running surfaces of the wheels.

4,512,591
HAND TRUCK
Jean-Paul Plante, Rang 11 St Ephrem, Co. Beauce Quebec, Canada
Filed Jul. 6, 1982, Ser. No. 395,296
Int. Cl.³ B62B 3/02
U.S. Cl. 280—47.35 9 Claims



1. A hand truck comprising, in combination:
(a) a substantially rectangular base frame defined by a pair of longitudinal side members and front and rear end members, said members being fixed in a horizontal plane;
(b) a handle adapted for connection to said front end member;
(c) four uprights each adapted for mounting in an opening provided at each corner of said base frame;
(d) a pair of support elements adapted for mounting to said uprights vertically above said side members;
(e) platform means adapted for support on said support elements;
(f) supporting mounts secured to said front and rear end members for receiving two of said uprights in an inclined plane relative to the plane of said base frame; and
(g) means for compactly storing in said base frame said handle, said uprights, said support elements and said platform means comprising a pair of parallel facing L-shaped cross-members secured to the underside of said side members and slidably receiving said platform means sideways therein.

4,512,592
FRONT FORK REINFORCING STRUCTURE IN MOTOR BICYCLE OR THE LIKE
Toshiharu Yoshioka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Sep. 16, 1982, Ser. No. 418,961
Claims priority, application Japan, Sep. 17, 1981, 56-137177[U]
Int. Cl.³ B62K 19/24
U.S. Cl. 280—279 2 Claims

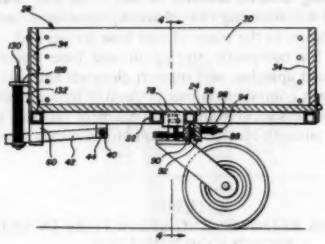


1. A front fork reinforcing structure for a motorcycle or the like, comprising:
a pair of telescopic forks each having a bottom case axially slidably engaged to a respective one of a pair of upper fork pipes;
means for rigidly connection said pair of fork pipes to each other at the upper portions thereof;
a pair of brackets, each extending radially outwardly from upper end portions of a respective one of said bottom cases and rigidly attached to said respective case; and
a connecting member having through-holes at either end thereof; and
bolt means threadingly engageable through said through-holes with said brackets for fixedly and replaceably securing said connecting member to both said brackets.

4,512,593
TRACKING TRAILER CONSTRUCTION
Henry B. Ehrhardt, 723 E. Highland Dr., Arlington, Wash. 98223
Filed Mar. 14, 1983, Ser. No. 475,629
Int. Cl.³ B60D 1/14
U.S. Cl. 280—460 R 10 Claims

1. A tracking trailer including a main frame having front and rear end portions, said front end portion including a pair of laterally spaced apart hitch means for releasable hitching to a pair of complementary hitch portions carried by the rear of an associated towing vehicle, a pair of caster wheel assemblies,

means mounting said caster wheel assemblies in laterally spaced apart depending relation from the rear end portion of said frame for full 360° angular displacement relative to said frame about corresponding upstanding axes, interconnecting



said caster wheel assemblies together for equal and simultaneous angular displacement relative to said frame, and frictionally resisting angular displacement of at least one of said caster wheel assemblies relative to said frame.

4,512,594

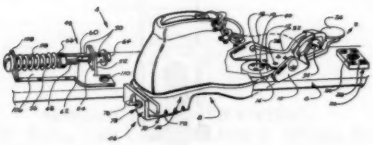
SAFETY SKI BINDING

Steven C. Eyre, P.O. Box 2348, Taos, N. Mex. 87571

Filed Aug. 31, 1983, Ser. No. 528,347

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—614 **8 Claims**



1. Ski binding, comprising:

(a) a front base plate;

(b) rotation means, attached to said front base plate and to a ski, for securing said front base plate to said ski, and for allowing said front base plate to rotate about an axis perpendicular to the surface of said ski;

(c) toe binding means, clampable to the forward portion of a ski boot and attached to said front base plate, for binding the toe of said ski boot to said front base plate;

lock means, attached in part to said front base plate and attached in remaining part to said ski, for locking said front base plate to said ski so as to prevent rotation of said front base plate with respect to said ski;

(e) a heel latch assembly, attached to the heel of said ski boot, comprising:

(1) a heel plate, having a horizontal bottom portion attached to the bottom of the heel of said ski boot and a vertical portion behind the heel of said ski boot, said heel plate having an aperture locates principally in said vertical portion of said heel plate and extending to the rear section of the bottom portion of said heel plate;

(2) heel latch means comprising a latch rotatably attached to the vertical portion of said heel plate for selectively closing the upper portion of said aperture;

(f) heel binding means, attached to said ski and having a forwardly extending member which is adapted to be received in the upper portion of said aperture, for securing said heel latch assembly in a fixed position with respect to said ski, and for allowing release of said heel latch assembly when sufficient transverse force is applied to said heel binding means by said heel latch assembly, and for allowing adjustment of the magnitude of said transverse force required to effect said release.

4,512,595

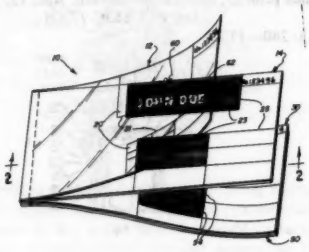
TAMPER-RESISTING NEGOTIABLE INSTRUMENTS CONTAINING A TRANSPARENT VERIFYING WEB

Thomas J. Breen, Arlington Heights, Ill., assignor to Rand McNally & Company, Skokie, Ill.

Filed Sep. 30, 1982, Ser. No. 425,064

Int. Cl.³ B42D *15/00;* **B41L** *1/00, 3/00;* **B41M** *3/12*

U.S. Cl. 283—70 **11 Claims**



1. A multipart negotiable instrument having improved resistance to tampering after inscription of an image thereon, said instrument comprising in stacked relation at least a first generally planar, substantially transparent web, a second generally planar web and a third generally planar web;

said first substantially transparent web being secured to said instrument and defining a first surface and a second surface, one of said surfaces adapted for receiving an image transferred from a surface in contact with said one surface when a corresponding image is inscribed against the surface of the top web in said stack;

said second web being removably secured to said instrument, and defining a first surface and a second surface, one of said surfaces being in contact with said one surface of said first web that is adapted for receiving images, said one surface of said second web including an image transferring means in register with at least a portion of said first web and capable of transferring an image to said one surface of said first web when a corresponding image is inscribed against a surface of said top web;

said image transferring means comprising a particulate matrix erasably bonded to said one surface of the second web and defacable when rubbed with an organic solvent, said means also being removable when an adhesive tape is applied to said image transferring means and then pulled away; and

said third web being removably secured to said instrument beneath the first and second webs in said stack and defining a first surface and a second surface, the first surface of said third web facing upwardly and including an area capable of visualizing an image when a corresponding image is inscribed against the surface of said top web, said image visualizing area being in register with the image transferring means of said first surface of said second web.

4,512,596

ANTI-UNSCREWING DEVICES

Georges Obrecht, Le Canton, France, assignor to Alsthom-Atlantique, Paris, France

Filed Apr. 19, 1983, Ser. No. 486,583

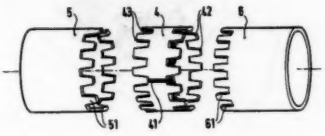
Claims priority, application France, Apr. 19, 1982, 82 06644

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—81 **7 Claims**

1. A device preventing the unscrewing of two elongated cylindrical bodies joined end-to-end in threaded union, said device comprising cylindrical rings respectively surrounding the two bodies and means for mounting them non-rotatable thereabout (them), the two facing edges of said rings having regular angular series of teeth on their entire perimeters, projecting axially into an axial gap between the two rings, and a

cylindrical blocking sleeve occupying said axial gap and surrounding the two aforementioned bodies, said sleeve having along the entire perimeter of each of its edges a regular angular series of axially projecting teeth meshing with the recesses between the teeth of the adjoining ring such that the device prevents the rotation of one body relative to the other, with a minimal diametrical encumberance, said device being provided with extenral means for installing and removing said blocking sleeve and wherein: said blocking sleeve comprises a resilient sleeve having a slit through its entire length enabling it to be radially expanded and oriented prior to its installation in the



gap between the rings and installed in said gap without displacement of said rings and wherein it is maintained as installed by resilient latching; the number of teeth of one ring and of the facing edge of the blocking sleeve being different from the number of teeth N+X of the other ring and of the other edge of the blocking sleeve, facing said other ring, the difference X between the two numbers N and N+X being small compared with the smallest N of the two, thereby requiring only a small fraction of a rotation X/2N (N+X), to eliminate the residual difference in alignment between the meshing teeth and recesses of the respective sleeve edge and adjoining ring edge after the sleeve has been oriented and lock said sleeve in place.

4,512,597

DOOR LOCK

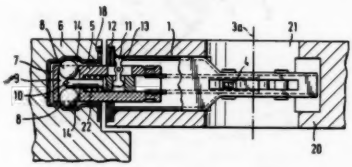
Elis Nabb, Björkboda, and Stig Eggert, Kärra, both of Finland, assignors to Oy Wärtsilä Ab, Helskinki, Finland

Filed Jul. 7, 1983, Ser. No. 512,103

Claims priority, application Finland, Jul. 12, 1982, 822469; Jan. 26, 1983, 830279

Int. Cl.³ E05B *1/16*

U.S. Cl. 292—143 **14 Claims**



1. A door lock, comprising a bolt and a mechanism for moving said bolt between a protruding locking position and a withdrawn unlocking position, said bolt being provided, in its protruding portion, with at least one auxiliary locking element movable in a transverse cavity in said bolt between a first outer position, in which it partly extends outside a lateral surface of said bolt, and a second retracted position, said bolt being further provided with an operating member movable in the longitudinal direction of the bolt and arranged to move said auxiliary locking element into its first position when said bolt reaches said protruding position, and a lever pivoted to the bolt, which lever, when said bolt approaches its protruding position, is arranged to meet a portion stationary with respect to said lock, whereby said pivoted lever is turned and thereby forces said operating member in a longitudinal direction of said bolt to bring said auxiliary locking element into its first position.

4,512,598

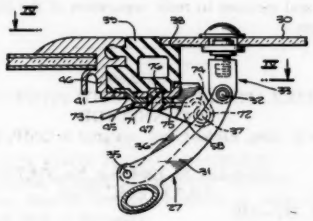
RELEASABLE LATCH BRACKET MEANS FOR A VEHICLE SUNROOF

John H. Coller, La Puente, Calif., assignor to D. G. Shelter Products Company, City of Industry, Calif.

Filed Oct. 21, 1980, Ser. No. 199,358

Int. Cl.³ E05C *17/32*

U.S. Cl. 292—263 **11 Claims**



1. In a latch means including a latch member for interconnecting a panel and a frame member defining an opening, the combination of:

bracket means carried by one end of said latch member to be connected to said frame member,

said bracket means including interlock means for cooperable releasable connection to said frame member to position and secure said one end of the latch member;

said interlock means including sequentially operable sets of interlock elements;

one of said sets of interlock elements including a lock pin on said bracket means,

and a port on said frame member to receive said lock pin;

the other of said sets of interlock elements including a lip portion on said bracket means,

and an elongated slot opening on said frame member adapted to receive said lip portion.

4,512,599

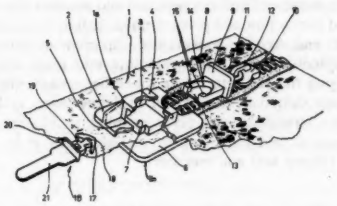
SECURITY SEALING SYSTEM

Eduardo De Lima Castro Netto, Rua Sao Luiz Gonzaga, No. 912, Rio de Janeiro, Brazil

Filed Jan. 10, 1983, Ser. No. 456,898

Int. Cl.³ B65D *33/34*

U.S. Cl. 292—307 R **7 Claims**



1. A security sealing system for a linear sliding closure, said system including a housing having a linear passage extending in a first direction, said passage having a first end which is open and a second end which is open, an insert member having a leading end which is insertable in a first direction into the first end of the linear passage, said insert member having a configurartion which substantially fills said passage at said first end thereof, first abutment means on the insert member for preventing the insert member from passing through said passage and for closing said first end of said passage, a seal member which is insertable into the second end of the passage in a

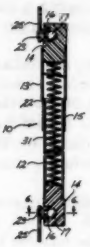
direction parallel to and opposite from said first direction; said seal member including a resilient detent, a second abutment means facing the detent, and a frangible section positioned between the detent and the second abutment means; said insert member having a cavity for receiving and containing the detent of the seal member when the insert and seal member are within the passage and the first and second abutment means are engaged with the ends of the passage, said cavity having internal surfaces therewithin which are cooperable with said detent of the seal member to resist separation of the insert and seal members.

4,512,600

COLLAPSIBLE STRUT WITH PIVOT JOINT CONNECTOR

Shaylor E. King, Elkhart, Ind., assignor to QMP, Inc., Elkhart, Ind.

Filed Jan. 30, 1984, Ser. No. 574,720
Int. Cl.³ E05C *17/30*
U.S. Cl. 292—338 **2 Claims**



1. A collapsible strut assembly having first and second shiftable telescopic tube members, said tube members being shiftable between extended and retracted positions, yieldable means for normally urging said tube members into their said extended position, an end member secured to one of said tube members, a socket formed in said end member, a pivot member having a ball connected to a shank, said pivot member ball fitted within said end member socket with said pivot member being pivotable relative to said end member, and a plate member connected to said pivot member shank and adapted for attachment to a support, said end member having a slot intersecting said end member socket at the location of said pivot member ball, a clip member fitted through said end member slot and overlying and contacting said pivot member ball to secure the ball within said end member socket, said clip member being formed of a resilient material and contacting said pivot member ball for urging the ball into the end member socket, said clip member being slotted from one end to define sides, said clip member sides straddling said pivot member shank, the improvement wherein said clip member includes tabs at its said one end overlying said end member.

4,512,601

CONTACT LENS HANDLING DEVICE

Benjamin Jacobstein, Coral Gables, Fla., assignor to Scientific Technology, Ltd., Coral Gables, Fla.

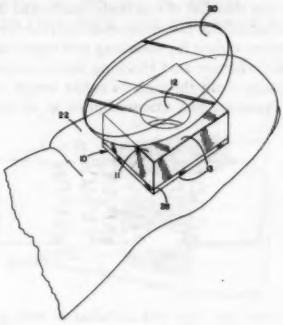
Filed Aug. 25, 1983, Ser. No. 526,332
Int. Cl.³ A61F *9/00*
U.S. Cl. 294—1.2 **14 Claims**

1. A contact lens applicator, comprising:

a base member having an upper surface and a lower surface, formed of a soft, biocompatible material;

a generally circular aperture extending through the base member for supporting a contact lens, said aperture being dimensioned so that the upper surface supports the contact lens without collapse of the lens while maintaining sufficient mechanical strength for said base member;

adhesive means for contacting the lower surface of said base member with a finger of a person applying the contact lens



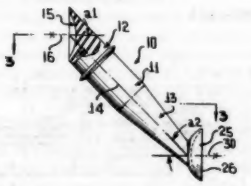
to an eye and securing the base member to the finger so that said lower surface is between said upper surface and the area of the finger contacted along a line generally perpendicular to the area of the finger contacted, said adhesive means being biocompatible.

4,512,602

DEVICE FOR INSERTING AND REMOVING CONTACT LENSES

Robert C. England, P.O. Box 2829, Zanesville, Ohio 43701

Filed Nov. 17, 1983, Ser. No. 552,707
Int. Cl.³ A61F *9/00*
U.S. Cl. 294—1.2 **5 Claims**



1. A device for inserting and removing hard contact lenses comprising an elongated body of resilient material having opposite terminal end portions, said elongated body including a central axis, static suction cup means at one of said terminal end portions for locating a hard contact lens at a predetermined angle to said central axis incident to placing the lens upon an eye, said static suction cup means being defined by a first static concave surface, soft resilient suction cup means at another of said terminal end portions for locating a hard contact lens at a predetermined angle to said central axis incident to removing the lens from an eye, said soft resilient suction cup means being defined by a body portion defined in part by a resilient peripheral lip and a second concave surface, said body portion and second concave surface being angularly offset relative to said central axis and defining therewith an acute angle, and said second concave surface being defined by a radius of generation which is disposed at an angle of generally 45 degrees to said central axis.

4,512,603
BOOK SUPPORT SYSTEM

Tommy A. Williams, 12902 N. Point La., Laurel, Md. 20708

Filed Feb. 1, 1983, Ser. No. 462,904
Int. Cl.³ A47B 23/00
U.S. Cl. 294—137 16 Claims

1. A book support system comprising:

(a) a housing having a recess formed therein, said recess having a predetermined contour adapted for receipt of a book, said housing being extended in a transverse direction;

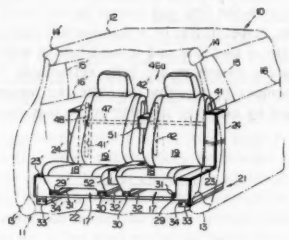
(b) means for releaseably constraining said book within said recess, said releaseable constraining means being coupled to said housing; and,

(c) a transversely extending tab member secured to said housing, said tab member defining a continuous tab wall member extending throughout the entire transverse dimension of said housing for providing a manual hold for said housing along said transverse dimension, said housing defining a pair of frontal members and a pair of upper and lower ledge members secured to said frontal members for forming a peripheral boundary of said recess.

4,512,604
VEHICULAR SEAT ARRANGEMENT

Kouzo Maeda, and Haıutoshi Tsujimura, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 7, 1982, Ser. No. 366,218
Claims priority, application Japan, Apr. 20, 1981, 56-57349[U]
Int. Cl.³ B60N 1/02
U.S. Cl. 296—65 A 18 Claims



1. A vehicular seat arrangement for use in an automotive vehicle having a vehicle body including a floor panel and a pair of side wall portions, comprising

at least two seat assemblies positioned on the floor panel in parallel with each other laterally of the vehicle body, each of the seat assemblies having a seat cushion portion positioned over and in parallel to the floor panel and a seat back portion upstanding from the seat cushion portion and rockable with respect to the seat cushion portion about a pivot axis in a lateral direction of the seat assembly,

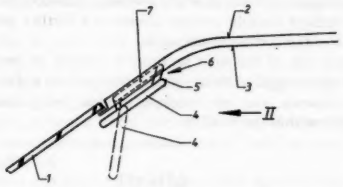
a seat reinforcing device including an elongated reinforcement member longitudinally extending in a lateral direction of the vehicle body between said side wall portions and passed in part through the seat back portion of one of said seat assemblies and in part through the seat back portion of the other of the seat assemblies, and

tilt regulating means permitting the seat back portion of one of said seat assemblies to tilt with respect to the seat cushion portion of the seat assembly about said pivot axis independently of the seat back portion of the other of the seat assemblies.

4,512,605
SUN VISOR FOR AUTOMOBILES

Willi Aschermann, Wuppertal, and Peter Haarhaus, Velbert, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed May 27, 1983, Ser. No. 498,842
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227719
Int. Cl.³ B60J 3/00
U.S. Cl. 296—97 G 16 Claims



1. A sun visor for a vehicle, comprising a sun visor body, movable between a non-use position against the ceiling of the vehicle and above a window of the vehicle and a use position which is at least partially covering the window of the vehicle; the body having a front which faces toward the window and an opposite rear which faces into the vehicle compartment; the body having a front edge which is down in the position of use and having an opposite rear edge; and

sun visor body support means for displacing the sun visor body so that its front edge moves down past the window while its rear edge moves forward beneath the ceiling; the support means comprising:

a bearing bracket at the front of the sun visor body and protruding out of the front, and also extending toward the rear edge of the body;

the bracket having a free end portion away from the body, and the end portion serving as a guide adapted for controlling the orientation of the body as it moves forward and rearward;

a guide rail at the ceiling of the vehicle for receiving the guide of the bracket; the guide rail being elongate for guiding the guide of the bracket along the pathway defined by the guide rail; the guide rail being of curved development for orienting the body to cause the front and rear edges of the body to move as described, as the body moves forward and rearward, respectively, between its use and non-use positions;

an additional pair of rails; the guide being shaped to extend to and be guided by both rails of the pair;

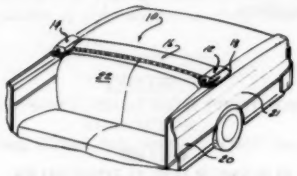
the guide comprising oppositely directed pins, and the additional pair of rails having guide grooves shaped and directed for receiving the pins.

4,512,606

CONVERTIBLE TOP BOOT COVER

D. Mark Trostle, Canton; Milton C. Kaltz, Allen Park; Ronald Moler, Garden City, and Lendell E. Cowsert, Trenton, all of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Apr. 29, 1983, Ser. No. 489,820
Int. Cl.³ B60J *7/20*
U.S. Cl. 296—130 **4 Claims**



1. In a boot cover of the type adapted to be removably emplaced over a convertible top comprises:

(a) a first rigid section for covering a first portion of a stowage compartment;

(b) a second rigid section for covering a second portion of a stowage compartment;

(c) an intermediate flexible section extending between and integral with the first and second rigid sections, the intermediate flexible section covering a further portion of a stowage compartment; and

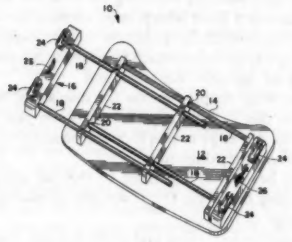
wherein one of the rigid sections is capable of overlying the other of the rigid sections, when not in use, to define a volume therebetween, the intermediate section being foldable and storable within the vehicle.

4,512,607

DETACHABLE PATIENT SERVING TRAYS

Edward D. Rapp, 500 N. Osceola, Clearwater, Fla. 33515

Filed Apr. 11, 1983, Ser. No. 483,519
Int. Cl.³ A47B *23/02, 83/02*
U.S. Cl. 297—153 **3 Claims**



1. A tray member of the type designed to be detachably secured to the frame of structures having tubular frames, comprising,

a flat, generally rectangular base member having a top article-supporting surface and a bottom surface,

a first guide member fixedly secured to the bottom surface of said base member, said first guide member disposed normal to the longitudinal axis of said base member and positioned adjacent a first lateral edge of said base member,

said first guide member provided with proximal and distal aperture members formed therein,

a second guide member fixedly secured to the bottom surface of said base member, said second guide member disposed parallel to said first guide member and positioned adjacent a second lateral edge of said base member,

said second guide member provided with proximal and distal aperture members formed therein,

a third guide member fixedly secured to the bottom surface of said base member, said third guide member disposed parallel to said first and second guide members and positioned intermediate thereof,

said third guide member provided with a first pair of proximal aperture members formed therein and a second pair of distal aperture members formed therein,

said first pair of aperture members being respectively axially aligned with the proximal aperture members formed in said first and second guide members,

said second pair of aperture members being respectively axially aligned with the distal aperture members formed in said first and second guide members,

a first handle member disposed parallel to said first, second and third guide members,

a proximal elongate rod member and a distal elongate rod member fixedly secured to sad first handle member and projecting laterally therefrom and respectively positioned so that the proximal rod member is slideably engaged with the proximal aperture member formed in said first guide member and with a first one of the proximal aperture members formed in said third guide member and so that the distal rod member is slideably engaged with the distal aperture member formed in said first guide member and with a second one of said proximal aperture members formed in said third guide member,

a second handle member disposed parallel to said first handle member,

a proximal elongate rod member and a distal elongate rod member fixedly secured to said second handle member and projecting laterally therefrom and respectively positioned so that the proximal rod member is slideably engaged with the proximal aperture member formed in said second guide member and with a second one of the proximal aperture members formed in said third guide member and so that the distal rod member is slideably engaged with the distal aperture member formed in said second guide member and with a second one of said distal aperture members formed in said third guide member,

said rod members collectively having a length substantially equal to the distance between said first and second guide members so that said first and second guide members act as stop means that limit the inwardly directed travel of said rod members,

and said first and second guide members being spaced inwardly from the first and second lateral edges of said base member, respectively, by a distance substantially equal to the width of said first and second handle members so that said handle members are fully retractable beneath said base member to thereby decrease the amount of space occupied by said tray member when it is stored.

4,512,608

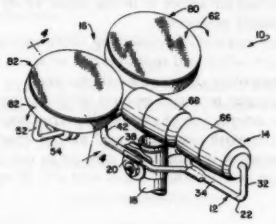
SADDLE ASSEMBLY

Homi K. Erani, 318 W. Seneca, Pierre, S. Dak. 57501

Continuation-in-part of Ser. No. 365,109, Apr. 5, 1982,. This application Sep. 22, 1982, Ser. No. 421,279
Int. Cl.³ B62J *1/00*
U.S. Cl. 297—201 **8 Claims**

1. In a saddle for a foot operated device, a horn assembly comprising a elongate horn extending fore to aft of the saddle and means for supporting said horn for rotary motion about an axis extending generally fore to aft, said horn including dis-

crete rollers each independently rotatable on said support means and each located at different fore to aft positions



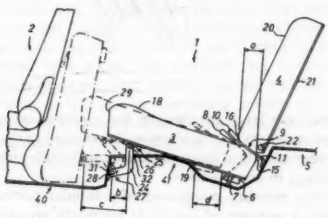
whereby a forward one of said discrete rollers would be free to rotate independent of a rearward one of said discrete rollers.

4,512,609

ARRANGEMENT IN A VEHICLE SEAT

Nils O. Pärsson, Trollhättan, Sweden, assignor to Saab-Scania AB, Sweden

Filed Mar. 25, 1983, Ser. No. 479,031
Claims priority, application Sweden, Mar. 30, 1982, 8202022
Int. Cl.³ B60N *1/02*; A47C *1/02*
U.S. Cl. 297—331 **4 Claims**



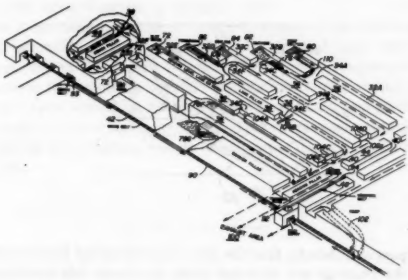
1. Arrangement in a passenger seat in a vehicle, preferably a passenger car back seat, for re-arranging said seat, including a seat cushion and a back cushion, said seat cushion being pivotably connected via at least one link to the vehicle body and separately arrangeable between a normal sitting position and a retracted substantially vertical loading position, the back cushion being pivotably connected to the vehicle body and separately arrangeable between a normal back support position and a downwardly-swung substantially horizontal loading position, the rear end of the seat cushion being situated under the lower end of the back cushion in their respective normal positions, characterized in that the link is pivotably attached to the seat cushion via a first joint and to the body via a second joint and in that in the normal sitting position of the seat cushion the first joint is situated closer to the back cushion than the second joint and above any supporting points between the seat cushion and the body, and in that the second joint is situated behind the forward end of the seat cushion, whereby a substantially parallel displacement of the seat cushion from its normal sitting position to a tipping position is allowed, the distance (d) between said positions being greater than a distance (a) between the rear end of the seat cushion and the lower forward edge of the back cushion in the normal sitting position of the seat cushion.

4,512,610

MINING SYSTEM

Clark J. Gilbert, Golden, Colo.; Menelaos D. Hassialis, Ridgewood, N.J.; Andrew H. Scrymgeour, Parker, and Samuel I. Vera, Golden, both of Colo., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 27, 1983, Ser. No. 499,040
Int. Cl.³ E21C *41/00*
U.S. Cl. 299—13 **5 Claims**



1. A method for mining a body of material occurring in generally horizontal subsurface formations comprising the steps of:

excavating a main entry in juxtaposition with the body of material;

excavating a heading entry perpendicular and connected to said main entry at one level;

excavating a bench entry perpendicular and connected to said main entry and parallel to said heading entry at a second level;

excavating a first plurality of lanes from said heading entry to said bench entry at said one level;

removing the material from said first plurality of lanes;

excavating a second plurality of lanes from said bench entry to said heading entry at said second level, said second plurality of lanes being located below said first plurality of lanes;

removing the material from said second plurality of lanes through said bench entry; and

connecting said first plurality of lanes and said second plurality of lanes.

4,512,611

OSCILLATED HEAD WITH BEARING SUPPORT AND QUICK DEMOUNTABILITY

Palmer Grasse, Glendale, Calif., assignor to Grasse Family Trust, Glendale, Calif., Palmer Grasse, Trustee

Continuation-in-part of Ser. No. 473,695, Mar. 9, 1983, Pat. No. 4,483,566, which is a continuation-in-part of Ser. No. 443,327, Nov. 22, 1982, Pat. No. 4,452,492, which is a continuation-in-part of Ser. No. 329,523, Dec. 10, 1981, Pat. No. 4,365,843, which is a continuation-in-part of Ser. No. 318,827, Nov. 6, 1981, Pat. No. 4,365,842. This application Jun. 1, 1983, Ser. No. 500,284
The portion of the term of this patent subsequent to Dec. 20, 1999, has been disclaimed.
Int. Cl.³ A47L *11/12*
U.S. Cl. 299—37 **19 Claims**

1. For use in power-operated floor stripping apparatus that includes a frame, a drive carried on the frame, wheels supporting the frame, a handle to guide the frame, and a cutting blade carried by a head which is pivotally mounted to the frame, the frame having side members the improvement comprising

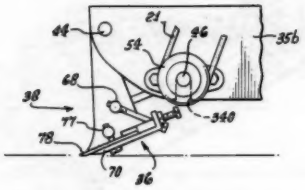
(a) a connecting element having a first tubular part and a second tubular part, said parts having spaced, parallel

axes, said second tubular part pivotally connected to the head,

(b) a drive shaft extending within said first tubular part, said shaft operatively connectible to the drive to be rotated thereby, and

(c) support bearings removably attached to the frame side members, the drive shaft having end portions rotatably supported by the bearings,

(d) the frame side members having apertures into which the drive shaft extends, said apertures opening peripherally to



pass and thereby free the drive shaft from the frame when the bearings are detached from the frame side members, whereby the drive shaft and said first tubular part may be demounted from the frame,

(e) said head consisting of lightweight metal and having two flanges interconnecting by a web, the flanges being locally thickened to substantial extent to define two lugs,

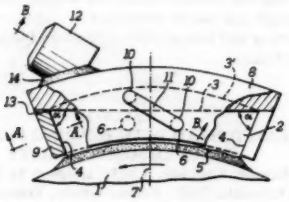
(f) and bearings carried by said lugs to form bearing openings for a pivot shaft removably connected to the frame, said bearings being lubricated adjacent the shaft.

4,512,612

SYSTEM FOR MOUNTING TOOTH-CARRIER SECTORS ON A CUTTER WHEEL OR A MILLING-CUTTER DRUM

Joseph Allard, Bourg en Bresse, France, assignor to Eurotungstene, Grenoble, France

Filed Jun. 29, 1983, Ser. No. 508,891
Claims priority, application France, Jul. 21, 1982, 82 13036
Int. Cl.³ E21C *35/18*
U.S. Cl. 299—91 **6 Claims**



1. A cutter wheel or milling-cutter drum comprising:

(a) a wheel which, during use, is rotated about an axis of rotation;

(b) at least one support which is mounted on the outer periphery of said wheel, said support being delimited by a radially outer surface which, in cross-section, is symmetrical with respect to an axis of symmetry which is perpendicular to the axis of rotation of said wheel and two lateral surfaces at opposite ends of said support, said lateral surfaces being symmetrical with respect to said axis of symmetry and being inclined inwardly from said radially outer surface by angles α which are identical and each of which is less than 90°;

(c) a tooth-carrier sector sized and shaped to fit snugly over said at least one support in either of two oppositely disposed positions, said tooth-carrier sector having an abutting surface which is sized and shaped to correspond to said lateral surfaces and which abuts against one of said two lateral surfaces when said tooth-carrier sector is in one of its two oppositely disposed positions and which abuts against the other of said two lateral surfaces when said tooth-carrier sector is in the other of its two oppositely disposed positions;

(d) means for releasably connecting tooth-carrier sector to said support when said tooth-carrier sector is in either of its two oppositely disposed positions; and

(e) a tooth-carrier mounted on said tooth-carrier sector,

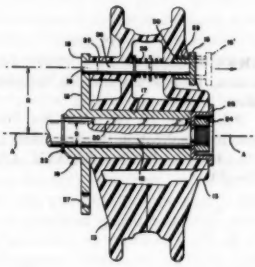
whereby the orientation of said tooth-carrier sector and said tooth-carrier with respect to said axis of rotation can be rapidly reversed, permitting a change in the direction of the rotation of said wheel about said axis of rotation.

4,512,613

WHEEL HUB LATCH MECHANISM FOR POWER WHEELCHAIRS

Joe-Massoud Nassiri, Thousand Oaks, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Dec. 2, 1982, Ser. No. 446,337
Int. Cl.³ B60B *27/00*
U.S. Cl. 301—1 **4 Claims**



1. A wheel hub latch mechanism for a power wheelchair having a power driven rear axle normally secured to the wheel hubs of the rear wheels of the wheelchair, said latch hub mechanism including, in combination:

(a) a bearing member comprised of a tubular portion surrounding a portion of said axle normally secured to a wheel hub and an integrally formed flange portion extending outwardly from the inner end of the tubular portion, the portion of said flange adjacent to its outer periphery having at least one hole passing therethrough in a direction parallel to the axis of the tubular portion and at a given radial distance therefrom;

(b) means for locking said bearing member to said portion of said axle for power rotation therewith;

(c) a wheel hub for carrying a rear wheel for said wheelchair journalled for free rotation on the exterior surface of said tubular portion of said bearing member, an inner side portion of said hub being juxtaposed to said flange portion and having a bore at the same given radial distance from the axis of said tubular portion as is said hole in said flange such that said bore can be positioned in registration with said hole by rotating said hub freely on said tubular portion of said bearing member; and

(d) pin means carried by said hub including a pin shank receivable in said bore and said hole when in registration with said bore for locking said hub to said flange so that said hub and wheel are driven by said flange when said rear axle is power driven, removal of said pin from said hole releasing said hub from said flange so that said hub and wheel supported thereby are independent of the power drive system and thereby essentially free-wheeling, said given radial distance of said hole and bore from the

axis of said tubular portion being greater than twice the diameter of said axle such that an increased driving torque is provided for said hub when said hub is locked to said flange, over that provided by direct connection of the axle portion to a wheel hub, thereby lessening strain on the hub latch mechanism.

4,512,614
WHEEL COVER WITH RETAINMENT SYSTEM

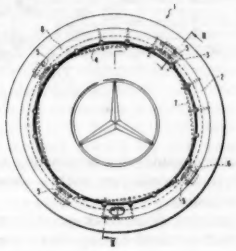
Bernd Löper, Korb, Fed. Rep. of Germany, assignor to Daimler-Benz A.G., Stuttgart, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,487

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137319

Int. Cl.³ B60B *7/06*

U.S. Cl. 301—37 P **17 Claims**



1. A retaining arrangement for a wheel cover made of plastic material and having a rim-like retaining means, comprising several substantially U-shaped retaining spring means having inner and outer legs, a circumferential, essentially non-springy support ring means, said retaining spring means being operable to engage with the radially outer leg thereof in a groove-shaped recess of a wheel rim, the inner leg of the retaining spring means being inserted, secured against rotation and axial displacement, in the rim-like retaining means of the wheel cover and being supported at said support ring means, and the retaining spring means being clipped on the support ring means and being operable thereby to support the wheel cover at the support ring means.

4,512,615
BRAKE CONTROLLER

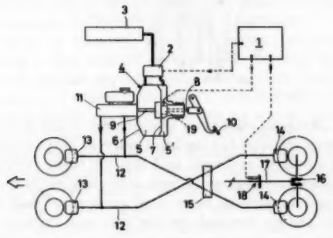
Yasuo Kita; Michio Moriya, both of Itami, and Kenichi Yoshida, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Jul. 14, 1983, Ser. No. 513,679

Claims priority, application Japan, Jul. 21, 1982, 57-128737; Jul. 21, 1982, 57-128738

Int. Cl.³ B60T *8/12*

U.S. Cl. 303—97 **12 Claims**



1. A brake controller for controlling a vehicle brake system having a plurality of brakes, a source of pressure, an actuator for controlling the pressure to be supplied to said brakes, and brake control means for operating said brake system, said brake controller comprising:

a control valve means interposed between said source of pressure and said actuator for controlling the pressure supplied from said source of pressure to said actuator;

a first sensing means for sensing the deceleration obtained by braking;

a second sensing means for sensing the force with which said brake control means is operated; and

data processing means for storing data representing a desired relationship between the deceleration and said force, processing the signals from said first and second sensing means to compute a desired deceleration corresponding to said force sensed on the basis of the stored data, and giving such a control signal to said control valve means that the actual deceleration will be equal to the desired deceleration.

4,512,616
SLIDING GUIDE

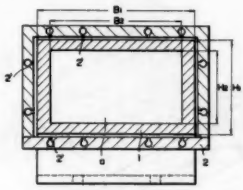
Shigemi Suzuki, Chigasaki, and Masahiro Mizukane, Yokohama, both of Japan, assignors to Toto Ltd., Kitakyushya, Japan

Filed Mar. 19, 1984, Ser. No. 590,821

Claims priority, application Japan, Mar. 25, 1983, 58-43050; Mar. 25, 1983, 58-43051

Int. Cl.³ F16C *29/02*

U.S. Cl. 308—3 R **14 Claims**



1. A sliding guide comprising a guide body made of a ceramic material of a hollow body whose sectional dimension ratio is less than 0.8 in an section perpendicular to a sliding direction of said sliding guide.

4,512,617
LINEAR BALL BEARING WHICH ACCOMMODATES SHAFT MISALIGNMENT

Lawrence M. Saravis, deceased, late of Milford (by Nancy Saravis, executrix); Jeffrey A. Stein, Bridgeport, and Darren S. Saravis, Milford, all of Conn., assignors to The Barden Corporation, Danbury, Conn.

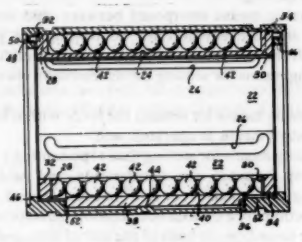
Filed Mar. 6, 1984, Ser. No. 586,768

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **11 Claims**

1. An improved linear ball bearing including in combination a cage formed with a plurality of ball path portions including loaded ball path portions and unloaded ball path portions and transition ball path portions connecting said loaded and unloaded ball path portions, a plurality of load plates cooperating with said loaded ball path portions and a sleeve surrounding

said cage and said load plates, said sleeve being provided with a plurality of internal bosses for cooperation with said load



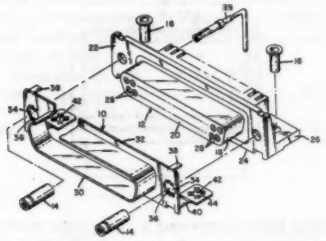
plates to permit said load plates to pivot around axes generally perpendicular to the lengths thereof.

4,512,618

GROUNDING MATING HARDWARE

Vijay Kumar, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 10, 1983, Ser. No. 473,935
Int. Cl.³ H01R *4/66, 13/648*
U.S. Cl. 339—14 R **2 Claims**



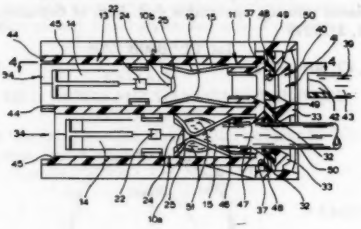
1. In combination with an electrical connector having a housing of rigid insulative material defining a mating face and a mounting face with a plurality of terminal passages extending between the faces, a peripheral flange around said mating face and mounting flanges on said mounting face each said peripheral and mounting flange being provided with at least one hole to receive locking and mounting means, respectively, therein, a plurality of electrical terminals mounted in said housing, each terminal having a mating portion directed toward the mating face and a mounting portion extending from the mounting face, a metal shell providing grounding interconnect between a shielded connector and the mounting surface characterized by a unitary metallic member having a shroud portion encircling the mating face to engage shielding of said shielded connector and an integral flange extending normal to the axis of the shroud portion, at least one mounting tab extending from a first edge of said flange adapted to engage one edge of said peripheral flange of said housing and at least one mounting tab adapted to lie adjacent said mounting face, each said flange and said mounting tab being provided with a profiled aperture providing wiping engagement between the shell and the respective locking means and mounting means.

4,512,619

INSULATION DISPLACEMENT TERMINAL FOR AN ELECTRICAL CONNECTOR AND ENVIRONMENTAL SEALING MEANS THEREFOR

Helen Dechelette, London, England, assignor to Molex Incorporated, Lisle, Ill.

Filed Jul. 20, 1983, Ser. No. 515,428
Claims priority, application United Kingdom, Jul. 23, 1982, 8221411; Aug. 9, 1982, 8222891; Jul. 6, 1983, 8318283
Int. Cl.³ H01R *4/24, 13/58*
U.S. Cl. 339—94 M **19 Claims**



1. A connector assembly for terminating an insulated wire having an electrical conductor with a sheath of insulation therearound, including:

a dielectric housing fitted with an electrically conductive terminal said terminal having means for displacing the insulation of said conductor upon relative movement with respect thereto, the improvement comprising:

said displacing means comprising at least one terminal wall portion deflectable into said conductor upon application of a force directed generally parallel to the longitudinal axis of said wire; and

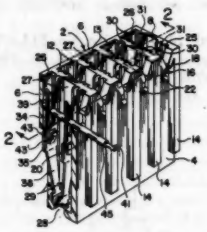
tab means integrally formed with said housing for securing said wire in said terminal after its termination to the connector assembly.

4,512,620

MASS TERMINATION ELECTRICAL CONNECTOR

John D. Tillotson, Southfield, Mich., assignor to Elco Corporation, El Segundo, Calif.

Filed Feb. 22, 1983, Ser. No. 468,418
Int. Cl.³ H01R *4/24, 13/41*
U.S. Cl. 339—97 P **16 Claims**



6. An electrical connector comprising: a one-piece housing of insulating material having front and rear vertical walls, a top end, and a bottom end wall, said housing being provided with a vertically extending cavity open at the top end of the housing and defined by vertical inner wall surfaces of said front and rear walls and by opposed vertical side wall surfaces of transverse walls extending between said front and rear walls, said cavity having a vertically extending center axis; a first pair of opposed, vertically extending, terminal retaining channels on

said opposed side wall surfaces of said cavity, said pair of channels being formed at least in part by protruding vertical ribs on said opposed side walls surfaces and being offset to one side of the said center axis of said cavity toward one of said housing front and rear walls and having open upper ends exposed at the top end of said housing and closed lower ends located within said cavity to provide terminal engaging stop shoulders therein; and an elongated terminal of flat metal strip material supported in and extending generally vertically through said housing cavity, said terminal having a flat terminal-retaining intermediate portion, a flat conductor-termination upper portion extending upwardly within said cavity and provided with a longitudinal wire termination slit extending vertically of said cavity and having an open upper end, and a generally flat lower contact leaf portion laterally inclined to the common plane of the said flat intermediate and upper portions of the terminal, said flat intermediate terminal portion having flat side flange extensions projecting from the opposite side edges thereof and providing downwardly facing abutment shoulders thereon; said side flange extensions being slidably force-fitted into the said pair of opposed channels in the housing cavity to retain the terminal in fixed upright and oriented position within the cavity with the said abutment shoulders on the terminal engaged with the said stop shoulders in the said channels to locate the terminal in predetermined vertical position within the cavity with the said lower contact leaf portion of the terminal inclined toward the said center axis of the housing cavity; at least one of said housing front and rear walls having an upwardly open notch opening therethrough extending vertically downward from the top end of the housing and coextensive with a portion of the length of and located opposite the slit in said inserted terminal for permitting transverse translational passage thereinto and forced entry into the said wire termination slit in said terminal of a wire conductor for electrical connection thereto.

4,512,621

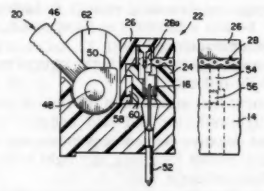
FLAT CABLE PITCH TRANSITION CONNECTOR

Gary C. Bethurum, El Segundo, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Continuation of Ser. No. 177,638, Aug. 13, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 422,614

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—99 R **4 Claims**



1. A pitch transition electrical connector assembly for making zero-insertion force connection between flat multiconductor cable of given pitch and an array of fixed electrical terminals having a given outer dimension, comprising:

a plurality of identical electrical contact elements, each having a first contact of insulation-piercing type and a second contact opposite and axially offset from said first contact, said contact including a socket portion defining a terminal receiving region having an access greater than said given outer dimension of said terminals;

an elongate housing adapted for receiving said cable and for engaging said contact elements therewith, said housing supporting said contact elements with such first contacts thereof in laterally spaced first and second rows, longitudinally successive ones of said first contacts being spaced by said given pitch, said housing supporting said second contacts in respective pairs, said contacts of each such pair being spaced mutually in lateral alignment, longitudinally adjacent ones of said pairs being spaced by a predetermined pitch exceeding said given pitch;

an elongate base circumscribing such terminal array and adapted for receiving said housing and placing said terminal receiving region of said second contacts individually in circumscribing relation about the respective terminals of the terminal array in preselected non-engaging registry with such terminals; and

actuator means for effecting relative longitudinal movement of said housing and said base to place said terminal contacting member of said second contacts individually in electrical engagement with said array terminals.

4,512,622

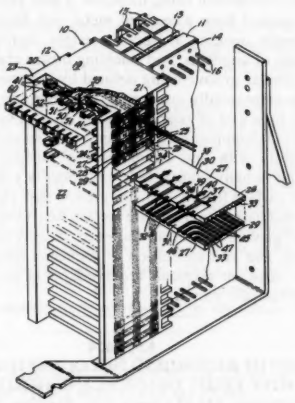
CONDUCTOR GUIDE MEANS FOR TELEPHONE CONNECTOR BLOCKS

William V. Carney, Oyster Bay, and Michael Fasano, Syosset, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,683

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 M **3 Claims**

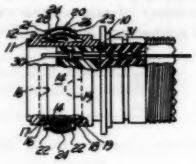


1. In a telephone connector block of a type including a first exposed wall mounting a plurality of quick clip connectors for engaging individual subscriber pairs, the improvement comprising: means for guiding individual pairs of conductors through said block to exit therefrom at identified locations for subsequent external connection, said means including a plurality of guide elements; said first exposed wall having a plurality of slotted openings therein disposed, said guide elements being of generally planar configuration and slidably positioned behind a slotted opening to extend inwardly from said first wall, each of said guide elements having channels therein accommodating a single pair of conductors; said block having a second exposed wall disposed at an angle relative to said first wall, and having elongated parallel slotted openings therein lying in co-planar relation relative to said first plurality of slotted openings; said guide elements being positioned with one surface thereof lying within said second plurality of slotted openings, whereby said guide elements provide continuous channels from said first mentioned wall to said second mentioned wall, and conductors may be inserted into said channels from either end thereof.

4,512,623
ELECTRICAL CONNECTOR ASSEMBLY HAVING MEANS FOR SHIELDING ELECTROMAGNETIC INTERFERENCE

Vladimir Tomsa, Chicago, Ill., assignor to Allied Corporation, Morristown, N.J.

Filed Feb. 3, 1984, Ser. No. 576,684
Int. Cl.³ H01R *13/653*
U.S. Cl. 339—143 R **11 Claims**



1. An electrical connector assembly comprising a plug connector member including a barrel telescoped into a shell of a receptacle connector member, said barrel including an annular groove therearound circumposed by the shell, a plurality of mated contacts therein, and shielding means disposed between the outer surfacc of said barrel and the inner surface of said shell for shielding said contacts from radio frequency interference, said shielding means comprising an annular band of arcuate cross-section being disposed in said groove, said band being stamped from a resilient metal and having alternating slots therein opening at opposite edges thereof to define a succession of segments, said shielding means characterized by:

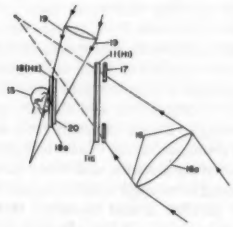
said annular groove being defined by a circumferential surface substantially concentric with the axis of said barrel and by a pair of laterally spaced annular undercuts; and

said band comprising a closed annulus disposed in contacting relation with said circumferential surface, said annulus being radially contractible and radially contracted about said surface from a diameter greater than the outer surface of said barrel, said arcuate section extending radially from said groove and being flattened radially inward by said shell, and said succession of segments being disposed so that adjacent segments are overlapping and said slots are substantially closed.

4,512,624
METHOD OF RECORDING HOLOGRAPHIC IMAGES IN WHITE LIGHT IMAGE PLANE HOLOGRAMS

Peter Nicholson, 141-17 Cherry Ave., Flushing, N.Y. 11355

Filed Nov. 23, 1981, Ser. No. 323,950
Int. Cl.³ G03H *1/22*; G02B *27/22*
U.S. Cl. 350—3.69 **2 Claims**



1. A method of producing a real image plane hologram from a transmission hologram produced with a diverging reference beam, and containing a recorded holographic image, comprising the steps of:

placing a mask defining a generally elliptically-shaped opening over the transmission hologram;

directing a reconstruction beam at the transmission hologram, to reconstruct a real image of the recorded holographic image, said beam being the conjugate, time-reversed beam of the reference beam used to create the transmission hologram;

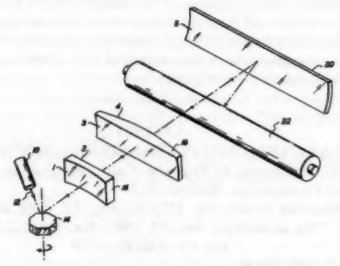
positioning a photographic hologram plate in a plane generally parallel to the plane containing the transmission hologram and approximately at the location of the reconstructed real image;

directing a converging reference beam at the photographic plate to thereby create a real image plane hologram, whereby the real recorded image can be reconstructed by illuminating the real image plane hologram with a diverging white light point source at the conjugate time reversed position of the converging reference beam when the plate is positioned having its emulsive side opposite to the diverging white light point source.

4,512,625
SCANNER OPTICS WITH NO CROSS SCAN FIELD CURVATURE

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 8, 1982, Ser. No. 433,340
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **9 Claims**



1. In a flying spot scanning system including a rotating light-reflector **14** and a medium to be scanned, wherein the improvement is characterized by:

negative element lens means **16** in the optical path from said rotating light-reflector,

positive element lens means **18** in the optical path from said rotating light-reflector and said negative element lens means, said negative element lens means and said positive element lens means focussing any light reflected by said rotating light-reflector, and

mirror means **20** in the optical path from said postive element lens means **18** for reflecting any said light focussed thereby onto said medium to be scanned, wherein wobble effects of said rotating light-reflector and distorting effects of field curvature are effectively eliminated.

4,512,626
ROTATING MIRROR SCANNER

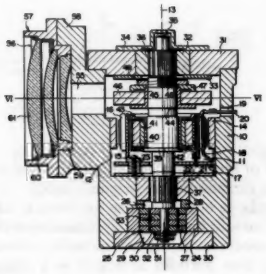
Masashi Kamiya, Tokyo; Katsunobu Ueda; Mitsuo Sumiya, both of Yokohama, and Tameyasu Tsukada, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 15, 1983, Ser. No. 504,424
Claims priority, application Japan, Jun. 24, 1982, 57-107529
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **13 Claims**

1. A rotating mirror scanner comprising:

a spindle having a pair of journals;

a rotor rotating with the spindle;
a stator for rotating the rotor;
a pair of bearings individually receiving the pair of journals;
a polygonal mirror disposed between the pair of journals and fixed to the spindle;
a housing fixedly fitted with one of the bearings and the stator and having at least one window facing the polygonal mirror so that a light reflected from the polygonal mirror passes through the window, the housing having an opening through which the rotor, the polygonal mirror, and the one bearing are inserted;



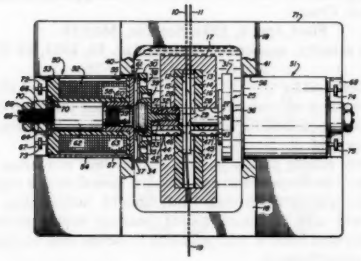
a cover fitted with the other bearing and removably closing the opening; and
means for floating the spindle, the means including at least one rotor magnet fixed on the spindle, and at least one stator magnet fixed to the housing so that the rotor magnet is inserted therein and having an inner surface facing the outer surface of the rotor magnet with a gap therebetween, the facing surfaces of the rotor and stator magnets being opposite in polarity.

4,512,627

OPTICAL FIBER SWITCH, ELECTROMAGNETIC ACTUATING APPARATUS WITH PERMANENT MAGNET LATCH CONTROL

Wendel E. Archer, Gahanna; James M. Luther, Pataskala, and Michael L. Thieken, Glenford, all of Ohio, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 13, 1982, Ser. No. 449,435
Int. Cl.³ G02B *7/26*; H01H *67/02*; H01F *7/08*
U.S. Cl. 350—96.20 **21 Claims**



1. Actuating apparatus for controlling the movement of a body from a first to a second position comprising a push-rod mounted on one side of said body to be freely movable in either direction along its longitudinal axis to bring one end of said rod into contact with one side of said body, a shuttle element comprising a connecting rod mounted to be freely movable in either direction along its longitudinal axis and a first actuating magnetic member provided at one end of said connecting rod transverse to its said longitudinal axis for latching said shuttle element in said first and second positions, said actuating member having a bearing surface for contacting the opposite end of said push-rod, and an electromagnet having a core positioned for magnetic coupling with said actuating magnetic member to release said shuttle element from one of said positions and position said shuttle element in another of said positions.

4,512,628

SPLICE CASING ASSEMBLY

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 31, 1983, Ser. No. 499,642
Int. Cl.³ G02B *7/26*
U.S. Cl. 350—96.20 **16 Claims**

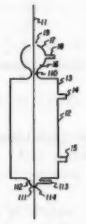
10. A splice casing assembly for a fiber optic splice housing assembly, the casing assembly comprising:
a tubular splice casing,
a mounting insert disposed within the splice casing and for supporting a splice housing assembly, the mounting insert comprising an elongated, rectangular platform portion and integral disklike portions disposed at opposite ends of the platform portion,
a pair of casing plugs, each individually fastened at an opposite end of the splice casing, said casing plugs each comprising a threaded portion for fastening to the splice casing, and
a pair of connectors for fiber optic cables, each of the pair individually fastened at a respective end of a casing plug and comprising a threaded portion for fastening to the casing plug, a polygonal gripping portion, a major cylindrical portion, and a minor cylindrical portion disposed between the polygonal gripping portion and the major cylindrical portion, whereby each of a pair of fiber optic cables may be routed in a mating fashion via an associated connector, through an associated casing plug and into an end of the fiber optic splice housing assembly, said splice housing assembly to be surrounded by the tubular casing.

4,512,629

OPTICAL FIBER WITH HERMETIC SEAL AND METHOD FOR MAKING SAME

Eric G. Hanson, Burlingame; Ronald Hiskes, Palo Alto, and Christopher A. Schantz, Santa Clara, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 30, 1982, Ser. No. 363,722
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.30 **2 Claims**

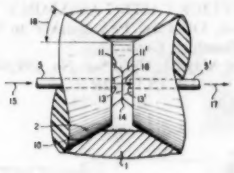


1. An improved optical fiber having an encapsulating hermetic coating consisting essentially of silicon and carbon.

4,512,630
OPTICAL FIBER CONNECTOR

Peter K. Runge, Fair Haven, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 630,930, Nov. 11, 1975, abandoned. This application Feb. 29, 1980, Ser. No. 125,941
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 2 Claims

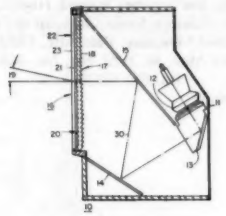


1. An optical fiber connector assembly comprising:
first and second connectors, each of which includes:
a circular cylindrical frustum-shaped mating portion which tapers from a larger diameter at a point along the body of said connector to a smaller diameter end surface;
a single optical fiber extending through said connector along the axis of said frustum-shaped mating portion and terminating at said end surface;
and a transparent, flexible contacting member extending over the end of the fiber; and
a disconnectable holder for receiving and holding said connectors in linear alignment for coupling between said fibers having:
first and second opposed, conical frustum-shaped hollowed receiving surfaces for receiving said first and second connectors, respectively, and automatically aligning the fibers terminating therein;
said connectors being in contact with said respective receiving surfaces, and the flexible contacting members of said connectors being in contact with each other.

4,512,631
REAR PROJECTION TELEVISION SCREEN INCORPORATING A PRISM LENS

Bertram VanBreemen, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1983, Ser. No. 487,382
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 18 Claims

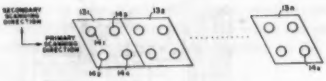


1. A rear projection television receiver, comprising:
a video image source; and
a rear projection screen comprising:
a field lens;
a prism array comprising a plurality of horizontally disposed prism elements, said prism elements incorporating facets for distributing light at a plurality of different predetermined angles, each of said angles defining a principal light ray angle of a component of the vertical audience envelope; and
a focusing lens for focusing said distributed light onto an image surface.

4,512,632
ORIGINAL READING APPARATUS

Jun Tokumitsu, Tokyo, and Kazuo Minoura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 250,947, Apr. 6, 1981, abandoned. This application Aug. 10, 1984, Ser. No. 640,204
Claims priority, application Japan, Apr. 15, 1980, 55-50124
Int. Cl.³ G02B 27/00
U.S. Cl. 350—167 7 Claims



1. An original reading apparatus comprising:
a plurality of image pick-up means disposed in the primary scanning direction of an original; and
a compound-eye optical system for forming an image of the original on said image pick-up means, said compound-eye optical system including end surfaces, a plurality of plastic effective lens portions arranged in a staggered fashion along said primary scanning direction and a plastic protective portion provided around and formed integrally with said effective lens portions to protect said effective lens portions against moisture entry from side surfaces of said effective lens portions, said protective portion separating said effective lens portions from said end surfaces of said compound-eye optical system by more than a predetermined length, said compound-eye optical system being divided into a plurality of lens blocks, each of said lens blocks including a plurality of said effective lens portions, the boundary surface defined between adjacent ones of said lens blocks being defined in said protective portion and being inclined at an oblique angle with respect to a plane perpendicular to said primary scanning direction so as to make the distance between said effective lens portion and said boundary surface greater than if said boundary surface were perpendicular to said primary scanning direction.

4,512,633
VEHICLE REARVIEW MIRROR REMOTE-CONTROL DEVICE

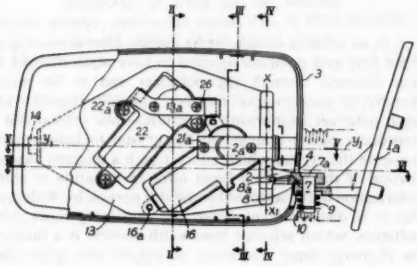
Stephane Manzoni, Saint Claude, France, assignor to Manzoni-Bouchot, France

Filed Apr. 6, 1982, Ser. No. 366,034
Claims priority, application France, Apr. 10, 1981, 81 07272
Int. Cl.³ G02B 7/18
U.S. Cl. 350—632 4 Claims

1. A rearview mirror remote-control device for controlling the movement of a mirror about a vertical axis and a horizontal axis comprising:
a hollow mirror casing having a front face mounting said mirror, an inboard and an outboard lateral side, a support means aperture through said inboard lateral side, and inboard and outboard casing bearing means mounted within said hollow mirror casing to define said horizontal axis therethrough;
support means having a body end adapted to be secured to a body of a vehicle and a casing end extending through said support means aperture into said hollow mirror casing, said casing end comprising support bearing means defining and locating said vertical axis within said hollow mirror casing substantially closer to one side of said inboard and outboard lateral sides than to the other of said sides, said support means further comprising a first support arm comprising said body end, a second support arm

comprising said casing end, and clutch means pivotably coupling said first and second support arms for normally preventing relative movement therebetween until a torque greater than a predetermined torque is applied to one of said first and said second support arms whereby said casing end is allowed to move relative to said body end only when a torque greater than said predetermined torque is applied to said hollow mirror casing;

cross-piece means pivotably secured to said inboard and outboard casing bearing means so as to allow a vertical pivoting about said horizontal axis and further being pivotably supported by said support means so as to allow a horizontal pivoting about said vertical axis, whereby said



horizontal pivoting of said cross-piece means about said vertical axis also pivots said hollow mirror casing thereabout;

vertical movement controlling means mounted to one of said hollow mirror casing and said cross-piece means for controlling said vertical pivoting of said hollow mirror casing relative to said cross-piece means about said horizontal axis; and

horizontal movement controlling means mounted to one of said support means and said cross-piece means for controlling said horizontal pivoting of said cross-piece means and said hollow mirror casing relative to said support means about said vertical axis.

4,512,634

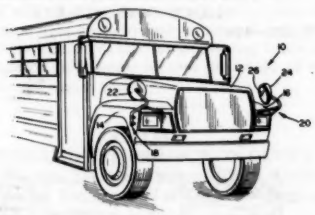
MOUNTING ASSEMBLY FOR SCHOOL BUS MIRROR

Thomas R. Stout, Lambertville, Mich., assignor to Safety Cross Mirror Co., Inc., Lambertville, Mich.

Filed Jul. 28, 1983, Ser. No. 518,120

Int. Cl.³ G02B *5/08, 5/10*

U.S. Cl. 350—632 **16 Claims**



9. A mounting assembly to be mounted on the body of a vehicle, said assembly comprising a main arm having a lower upright portion, an intermediate angular portion to extend upwardly and forwardly relative to the vehicle body when said arm is mounted thereon, and an upper portion extending upwardly from the intermediate angular portion, bracket means to be mounted on the vehicle body and frictionally engaging said lower upright portion of said arm, a brace clamp mounted on said intermediate portion of said arm and having bolt holes therein, a bolt extending through said bolt holes, and a nut on a shank of said bolt, a brace terminating in a flat end having a longitudinally-extending slot terminating at an edge of said end, said end being engaged by said clamp, said bolt extending through said slot and causing said clamp to frictionally engage said end when said nut is tightened on said bolt, the other end of said brace having means to mount said other end on said vehicle.

4,512,635

DENTAL MIRROR APPARATUS

Chris R. Melde, 7007 Third Ave., Scottsdale, Ariz. 85251

Continuation-in-part of Ser. No. 259,659, May 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 93,621, Nov. 13, 1979, abandoned. This application Jan. 4, 1982, Ser. No. 337,085

Int. Cl.³ G02B *7/18;* **A61B** *1/24*

U.S. Cl. 350—640 **13 Claims**

1. Dental mirror apparatus comprising, in combination:

handle means, including a stem;

mirror means, including a first mirror and a second mirror, and at least one of which mirrors comprises a front surface mirror, and having an outer periphery;

holder means secured to the stem of the handle means for holding the mirror means, and including

a rim deformable for releasably holding the mirror means,

an inner periphery for receiving the outer periphery of the mirror means,

a midline extending about the inner periphery, and

a plurality of faces on the inner periphery and extending generally upwardly and downwardly from the midline, including a first plurality of vertical faces and a second plurality of sloping faces alternating about the inner periphery.

4,512,636

LIQUID CRYSTAL COMPOUNDS

Beatrice M. Andrews, Grimsby; Neil Carr, Hull; George W. Gray, Cottingham, and Christine Hogg, Beverley, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdon of Great Britian and Northern Ireland of Whitehall, London, England

Filed Jun. 7, 1983, Ser. No. 501,783

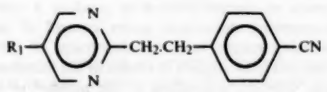
Claims priority, application United Kingdom, Jun. 15, 1982, 8217355

Int. Cl.³ G01F *1/13;* **C09K** *3/34;* **C07D** *239/26, 319/06*

U.S. Cl. 350—350 R **3 Claims**

1. A pyrimidine compound having the formula:

Formula I

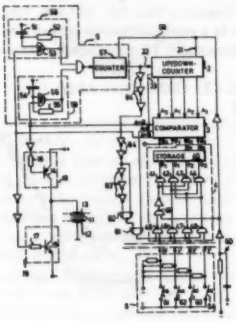


wherein R_1 represents an alkyl group.

4,512,637
METHOD AND MEANS FOR STEPWISE CHARGE CONTROL OF ELECTROCHROMIC LAYERS

Horst Ballmer, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,173
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142906
Int. Cl.³ G02F 1/23
U.S. Cl. 350—357 17 Claims

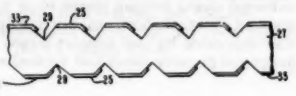


1. Apparatus for step-wise charge control of an electrochromic layer, said layer being in uncolored state for the condition of no charge in said layer, said layer being colored to a first state for a first charge in said layer, and said layer being colored to a second and greater colored state for a second and greater charge in said layer, said apparatus comprising: selectively operable means for selecting a change of layer state to one of said states regardless of the currently existing state of said layer; said selectively operable means including comparator means responsive both to the existing state and to the selected state and having (1) a first control output for the case of the layer in the selected state being more colored than in the existing state ($A < B$), (2) a second control output for the case of the layer in the selected state being less than in the existing state ($A > B$); a constant-current charging circuit connected to charge said layer in the event of a signal in said first control output; a constant-current charge-removal circuit connected to remove charge from said layer in the event of a signal in said second control output; first interval-timing means connected for response to said first control-output signal and connected to said charging circuit to determine a timed incremental charge in said layer in the direction of increased color development in said layer, and second interval-timing means connected for response to said second control-output signal and connected to said constant-current charge-removal circuit to determine a timed decremental removal of charge from said layer, the timed interval for a charging increment to produce a given layer-coloring increment under control of said first interval-timing means being greater than the timed interval for a corresponding decrement of charge removal to produce a corresponding color-removing decrement under control of said second interval-timing means, and said decrement of color removal being selected to be slightly in excess of the increment of layer coloring, whereby regardless of the number of selected increment-decrement cycles there will be no cyclic growth in the coloring of said layer.

4,512,638
WIRE GRID POLARIZER

Sambamurthy Sriram, Wilkins; Kenneth Steinbruegge, Murrysville, and Emmanuel Supertzi, Oakland, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,594
Int. Cl.³ G02F 1/11
U.S. Cl. 350—372 9 Claims



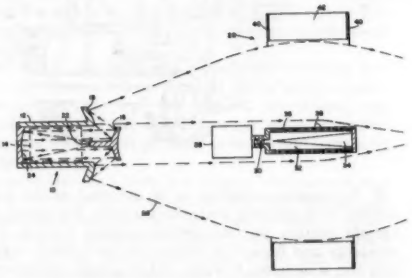
1. In an infrared acousto-optic tunable filter consisting of: an input wire grid polarizer adapted to have input infrared radiation directed through the polarizer and to be polarized thereby; an acousto-optic member, optically aligned with the input polarizer, comprising an acousto-optic crystal and an rf transducer means coupled to the crystal to launch acoustic waves in the crystal which interact with a selected bandwidth portion of the polarized input infrared radiation to shift the polarization of the selected bandwidth portion by 90 degrees so that it is distinguishable from the remaining input infrared radiation, which selected bandwidth portion is a function of the rf energy input frequency; an output wire grid polarizer optically aligned with the output face of the acousto-optic crystal and oriented with the wires aligned orthogonal to the wires of the input wire grid polarizer, whereby only the 90-degree shifted polarized selected bandwidth portion of the infrared radiation transmitted through the acousto-optic member passes through the output wire grid polarizer for analysis, the improvement wherein said input and output wire grid polarizers each comprise:

a substrate selected from the group consisting of single crystal silicon and single crystal gallium arsenide and having an infrared radiation input surface and an infrared radiation output surface opposite said input surface, both of said surfaces having alternately disposed infrared transmissive zones and electrically conductive zones, said conductive zones having a spacing of at least about 2000 zones per millimeter.

4,512,639
ERECTABLE LARGE OPTIC FOR OUTER SPACE APPLICATION

Thomas G. Roberts, Huntsville, and Thomas E. Honeycutt, Somerville, both of Ala., assignors to The United States of American as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 510,709
Int. Cl.³ G02B 3/12, 3/14
U.S. Cl. 350—418 5 Claims



1. An erectable optics for outer space applications comprising a housing having a resonator cavity therein with reflective

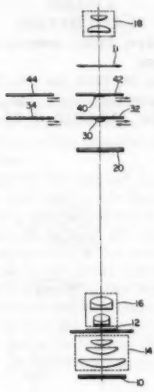
mirror means at opposite ends of the resonator cavity for reflecting light out of the resonator cavity, a beam reflector and a beam expander mounted on said housing for receiving said reflected out light and for expanding said light, a gas dynamic lens mounted relative to said housing, and said gas dynamic lens being constructed so as to focus and direct the expanding light coming from said beam expander toward a target.

4,512,640

POLARIZING MICROSCOPE

Toshiaki Nihoshi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,402
Claims priority, application Japan, Jun. 4, 1982, 57-95793
Int. Cl.³ G02B *21/00, 15/10, 27/00*
U.S. Cl. 350—510 **5 Claims**



1. A polarizing microscope comprising:
(a) an orthoscopic system having an objective lens for forming the image of a sample; and
(b) a conoscopic system including polarizer means, analyzer means and an image forming lens disposed between said objective lens and the image plane of the image of said sample, said image forming lens being disposed at a position whereat the exit pupil of said objective lens and said image plane are conjugate with respect to said image forming lens and having a sufficiently small diameter relative to the width of the optical path of said orthoscopic system in said position;
whereby said conoscopic system forms the image of the exit pupil of said objective lens on said image plane and the observation light beam by said orthoscopic system passes through the outside of said image forming lens and forms the image of said sample around the image of said exit pupil on said image plane.

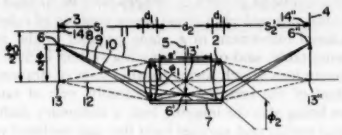
4,512,641

COMPOUND EYE PROJECTION DEVICE

Noritaka Mochizuki, Yokohama; Setsuo Minami, Kawasaki, and Yoshiya Matsui, Yokohama all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,482
Claims priority, application Japan, Mar. 31, 1981, 56-47621
Int. Cl.³ G02B *27/00, 27/40*
U.S. Cl. 350—573 **3 Claims**

1. A compound eye projection device comprising:
a plurality of element lens systems, each element lens system consisting essentially of first and second lenses of identical shape arranged along a common optical axis, said plurality of element lens systems being arranged in at least one row such that the optical axes of said plural element lens sys-



tems are substantially parallel, said element lens systems satisfying the following conditions:

$$0.8r < r_1 = -r_2 < 1.2r$$

$$r = \frac{(n-1)+\left[(n-1)^2-\frac{1}{S_1}\times\left(\frac{\phi_0}{\phi_1}-1\right)\times d\times\frac{(n-1)^2}{n}\right]^{\frac{1}{2}}}{\frac{1}{S_1}\left(\frac{\phi_0}{\phi_1}-1\right)}$$

$$0.8\times 2S_1\times\frac{\phi_1}{\phi_0} < e' < 1.2\times 2S_1\times\frac{\phi_1}{\phi_0}$$

$$0.36\phi_0 < P < 0.44\phi_0$$

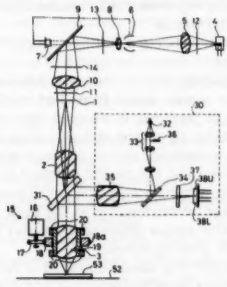
where r_1 and r_2 are the radii of curvature of the object side surface and the image side surface of the lenses constituting said element lens systems, n is the refractive index of each lens, d is the on-axis thickness of each lens, ϕ_1 is the effective diameter of each lens, e' is the principal point interval between each first lens and associated second lens, ϕ_0 is the maximum diameter of the effective object view field, S_1 is the distance from the object side surface of each first lens to an object, and P is the interval between the element lens systems in the row direction.

4,512,642

AUTOMATIC FOCUSING APPARATUS IN OPTICAL DRAWING MACHINE

Tokuhisa Ito, Tokyo; Hideaki Ohno, Sakadoshi; Izumi Kurata, Tokyo, and Takashi Okuyama, Urawashi, all of Japan, assignors to Ashai Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,567
Claims priority, application Japan, Sep. 18, 1981, 56-147243
Int. Cl.³ G03B *41/00*; G01J *1/20*
U.S. Cl. 354—4 **3 Claims**



1. An apparatus of automatic focusing in an automatic optical drawing machine comprising a photohead carrying a drawing optical system having an imaging lens assembly, and a drawing table which lies in a plane perpendicular to an optical

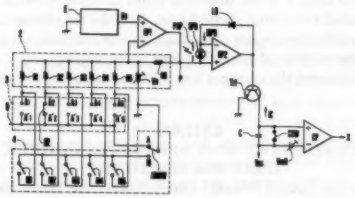
axis of the drawing optical system and which holds thereon a photosensitive material with a photosensitive surface on which a predetermined pattern of images is to be formed, said drawing table and said photohead being capable of relative two-dimensional movement in a plane parallel to the plane of the drawing table, said optical drawing system including a pair of collimate lens which forms parallel lines of drawing light flux incident of the imaging lens assembly, one of said collimate lenses being also the imaging lens, a stationary dichroic mirror located within said parallel light flux and inclined with respect to the optical axis of the flux, an actuator for moving only said imaging lens in the optical axis, said mirror transmitting drawing light and reflects focus detecting light to which the photosensitive material is insensitive, and a focus detecting device which illuminates and reflects the focus detecting light on the photosensitive surface of the photosensitive material through the dichroic mirror and the imaging lens of the drawing optical system to detect whether the photosensitive surface is located in the depth of focus of the drawing optical system in accordance with the reflecting light, said focus detecting device being adapted to produce and give a drive signal to said actuator so as to continuously maintain the photosensitive surface of the photosensitive material within the depth of focus of the drawing optical system.

4,512,643

EXPOSURE CONTROL DEVICE FOR CAMERA

Ryuji Tokuda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,754
Claims priority, application Japan, Mar. 2, 1983, 58-34171
Int. Cl.³ G03B *7/083, 7/24*
U.S. Cl. 354—21 **9 Claims**



1. An exposure control device for a photographic camera having a shutter comprising:

(a) means for producing a digital signal in accordance with a code signal representative of a film sensitivity on a film cartridge;

(b) means for converting the digital signal from said digital signal producing means to an analog signal corresponding to the digital signal;

(c) means for producing a voltage proportional to absolute temperature;

(d) first amplifying means having a first input terminal to receive the analog signal from said converting means, a second input terminal to receive the voltage from said voltage producing means and an output terminal;

(e) feedback impedance means connected between the first input terminal and the output terminal of said first amplifying means, whereby said first amplifying means producing a voltage corresponding to the analog signal;

(f) light sensitive means disposed to receive the light from an object to be photographed;

(g) second amplifying means arranged to receive the voltage from said first amplifying means and for amplifying the output from said light sensitive means;

(h) impedance means connected to a feedback path of said second amplifying means for logarithmically compressing the output from said light sensitive means;

(i) variable impedance means connected to an output terminal of said second amplifying means and for expanding the output from said second amplifying means into the inverse-logarithmic output;

(j) integrating capacitor means for integrating an output from said variable impedance means in accordance with the opening operation of said shutter; and

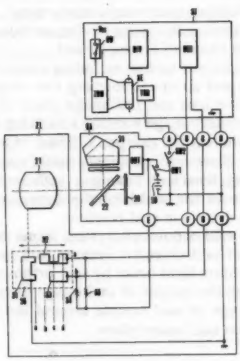
(k) shutter triggering means for closing said shutter when the voltage accross said integrating capacitor means reaches a predetermined value.

4,512,644

FLASH DEVICE

Masaaki Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,369
Claims priority, application Japan, Jan. 31, 1983, 58-15338
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—149.1 **10 Claims**



1. A flash device for a camera having a flash part arranged to be shiftable from an ordinary photographic position for bounce flash photography, comprising:

(a) input means for receiving information on the focal length of a photo-taking lens;

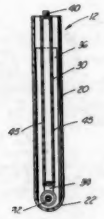
(b) illuminating angle adjusting means for adjusting the illuminating angle of a flash of light to be emitted from said flash part according to the focal length information obtained through input means; and

(c) control means for supplying, in the case of bounce flash photography, said illuminating angle adjusting means with predetermined illuminating angle information in place of said focal length information.

4,512,645
FILM PROCESSOR TANK WITH TANK DIVIDER

Billy M. Engelhardt, Lakeworth, Tex., and Dwane L. Moore, Wichita, Kans., assignors to Jamieson Film Company, Dallas, Tex.

Filed Mar. 22, 1984, Ser. No. 592,467
Int. Cl.[3] G03B 3/02
U.S. Cl. 354—324 3 Claims



1. An improved film processor tank for receiving film, paper and the like therein, the tank mounted in a film processor unit for receiving a fluid such as film processing chemicals or dryer air, the tank comprising:

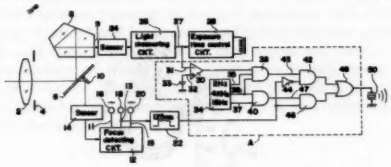
a tank housing integrally formed and having a round bottom and an overflow port in the side thereof; and

a hollow tank divider disposed along the length of the tank and slidably received therein, the divider having a concave idle roller mounted on the bottom thereof, the divider having an inlet port in the top thereof for receiving the fluid and apertures along the length thereof for discharging the fluid into the tank housing adjacent the film as it is transported thereby, the opposite sides of the divider concave in shape for limiting the contact of the film against the sides of the divider as the film is transported thereby.

4,512,646
ACOUSTIC INDICATING DEVICE FOR CAMERAS

Mashio Kitaura, Tondabayashi; Norio Ishikawa, Osaka, and Toshihiko Ishimura, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1984, Ser. No. 580,313
Claims priority, application Japan, Feb. 25, 1983, 58-27593[U]
Int. Cl.[3] G03B 3/00
U.S. Cl. 354—409 9 Claims



1. An acoustic indicating device for cameras in which an exposure time is automatically controlled in accordance with a measured object brightness and which has an objective lens, said device comprising:

a first signal generating means for generating a first signal of a first frequency when an anticipated exposure time to be controlled automatically is longer than a given value;

a focus condition detecting means for generating an in-focus signal when an in-focus condition is obtained with the camera objective lens;

a second signal generating means responsive to said in-focus signal for generating, for a given time period, a second signal of a second frequency, which is higher than said first frequency;

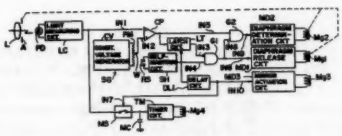
an acoustic means, responsive to said first and second signals, for generating an audible sound intermittently at said first and second frequencies, respectively; and

means for interrupting, for said given time period, the supply of said first signal to said acoustic means in response to the generation of said in-focus signal.

4,512,647
AUTOMATIC DIAPHRAGM CONTROL AND MIRROR RELEASE DEVICES FOR CAMERAS

Keiji Yamazaki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 392,061, Jun. 25, 1982, abandoned, which is a continuation of Ser. No. 259,764, May 1, 1981, Pat. No. 4,339,186. This application Nov. 23, 1983, Ser. No. 554,175
Claims priority, application Japan, May 2, 1980, 55-57798
The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.
Int. Cl.[3] G03B 7/087
U.S. Cl. 354—441 14 Claims



1. In a camera for use with a diaphragm mechanism having a normally fully open aperture capable of being stopped-down to a desired size before camera exposure operation, a combination comprising:

diaphragm operating means for stopping-down said diaphragm aperture towards a minimum size opening thereof;

light measuring means for receiving light from an object to be photographed through said diaphragm aperture and generating a light measurement signal as a function of the received light;

means for generating a reference signal as a function of at least one exposure parameter other than the diaphragm aperture;

means for comparing said light measurement signal with said reference signal and generating a comparison signal representative of the relative magnitude of the two signals;

diaphragm arresting means for arresting said diaphragm operating means in accordance with the comparison signal generated while said diaphragm operating means is stopping-down said diaphragm aperture;

means for restraining said diaphragm operating means and said diaphragm arresting means;

release means for releasing the restraint of said diaphragm operating and arresting means to allow operation thereof;

control means responsive to said comparison signal for generating a control signal when the light measurement signal generated before the actuation of said diaphragm operating means is of a value, with respect to said reference signal, requiring a fully open diaphragm aperture; and

means for preventing the operation of said release means in response to said control signal.

4,512,648
PROGRAM TYPE AUTOMATIC EXPOSURE CONTROLLER FOR USE IN CAMERAS

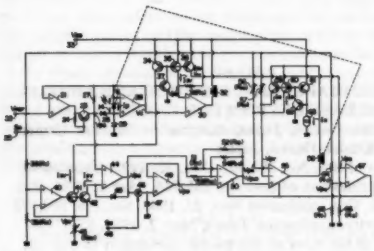
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

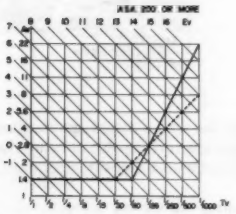
Filed Feb. 3, 1984, Ser. No. 577,063

Claims priority, application Japan, Apr. 14, 1983, 58-55970[U]

Int. Cl.³ G03B 7/08

U.S. Cl. 354—443 3 Claims





1. A program type automatic exposure controller for use in a camera, comprising:

photometry means for measuring light from an object being photographed which is transmitted through a taking lens and an aperture;

program constant means for determining a program constant to conduct an aperture control operation in response to a value measured by said photometry means and information representing a film sensitivity;

aperture control means for making a stop-down operation of the aperture in response to an output of said program constant means;

switching means for switching a program constant in said program constant means by selecting an inclination of a predetermined program characteristic and a starting point of the stop-down operation suitable for each of a plurality of film sensitivity information regions which are formed by dividing a range for setting information of a film sensitivity, in response to a selection signal which is produced in said each of film sensitivity information regions;

and shutter control means for controlling a shutter by integrating photometric values from said photometry means after termination of the stop-down operation by means of said aperture control means.

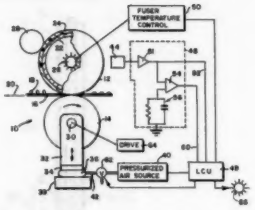
4,512,649
FUSER APPARATUS

John Derimiggio, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,260

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 FU 3 Claims



1. In reproduction apparatus having a path along which toner image carrying supports are moved, fuser apparatus comprising:

a heated fuser member which contacts toner image carrying supports moved along said path;

means, spaced from said fuser member, for sensing the temperature of said fuser member and for producing a signal representative of said temperature; and

logic and control means connected to said sensing means for maintaining the temperature of said fuser member within predetermined limits and for interpreting a sudden large drop in the temperature sensed as a jam condition caused by a support deviating from said path and interposing between said fuser member and said means for sensing.

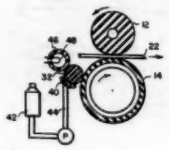
4,512,650
FUSER APPARATUS HAVING A UNIFORM HEAT DISTRIBUTION

Haribhajan S. Kocher, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,610

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 FU 10 Claims



1. Fuser apparatus comprising:

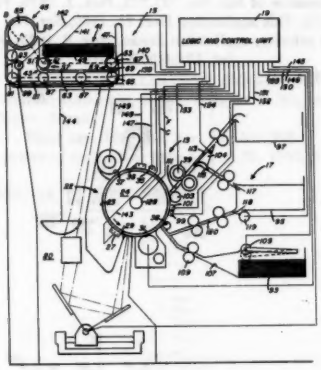
a movable heated fuser member for fusing a toner image carried by a support moved into contact with the member at a fusing region; and

means for maintaining the temperature of said fusing member substantially uniform along the length thereof by redistributing heat from hotter regions to cooler regions of the member, said temperature maintaining means being located in advance of said fusing region relative to the direction of support movement, and said temperature maintaining means being in engagement with said fuser member and movable relative to the fuser member.

4,512,651
COLLATING DOCUMENT FEEDER AND REPRODUCTION APPARATUS HAVING COPY DUPLEXING CAPABILITIES

James E. Dunleavy, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,041
Int. Cl.[3] B65H *3/06, 5/26*
U.S. Cl. 355—14 SH 15 Claims



1. A feeder for presenting a set of simplex or duplex document sheets to a duplicating apparatus, the duplex sheets bearing information on first faces oriented in one direction relative to the set and second faces oriented in the opposite direction, and the simplex sheets bearing information only on first faces oriented in the same direction relative to the set, said feeder comprising:

a hopper for receiving a set of document sheets and having first and second exits through which individual sheets are removed;

means spaced from said hopper and defining an exposure position at which the document sheets are located one face at a time for copying by such duplicating apparatus; and

means for circulating the set of plurality of times one-sheet-after-another, from said hopper to said exposure position and back to the set in said hopper, said circulating means including means for removing duplex sheets through said first exit and for presenting the second faces for copying in said exposure position on the first and every odd circulation of the set and for presenting the first faces for copying in said exposure position on the second and every even circulation of the set, and further including means for removing simplex document sheets through said second exit and for presenting the first faces in succession to said exposure position.

4,512,652
CONTROL SCHEME COMPENSATING FOR CHANGING CHARACTERISTICS OF A PHOTOCONDUCTIVE MEMBER USED IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Kenneth J. Buck, Ontario; Robert E. Grace, Fairport, and Thomas A. Hayes, Jr., Leroy, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

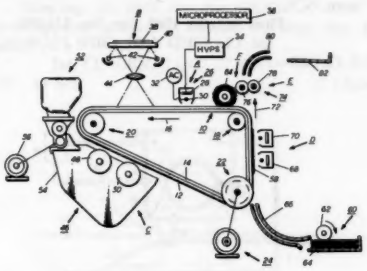
Filed Aug. 24, 1983, Ser. No. 525,855
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 CH 12 Claims

1. An electrophotographic printing machine, including:

a photoconductive member;

means for charging said photoconductive member to a selected potential; and

means for controlling said charging means to regulate the current charging said photoconductive member, said controlling means calculating a scale factor as a function of the time elapsed between successive operating cycles

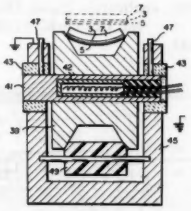


and a constant characterizing said photoconductive member and regulating the current charging said photoconductive member as a function of the calculated scale factor.

4,512,653
METHOD AND APPARATUS FOR THERMALLY-ASSISTED GROUNDING OF AN ELECTROGRAPHIC IMAGING MEMBER

Yee S. Ng, Rochester; James G. Jarvis, and John R. Thompson, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,759
Int. Cl.[3] G03G *15/12*
U.S. Cl. 355—16 13 Claims



1. In electrographic apparatus adapted for the use, along an operative apparatus path, with an image member having an electrically conductive, reference-potential layer covered by electrically insulative thermoplastic material, a contacting device comprising:

means for heating a portion of the thermoplastic material so that such portion is softened;

an electrically conductive contact member engageable with such softened portion;

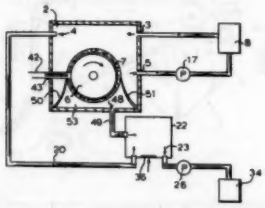
means for electrically coupling said contact member to a source of a reference potential; and

means for urging pressure engagement between said softened portion of the insulative material and said contact member so that the insulative material is displaced and a low resistance electrical connection is effected between said contact member and the conductive layer.

4,512,654
CONTROLLING AMMONIA EMISSIONS FOR DIAZO DEVELOPING EQUIPMENT

Eduard Feitzinger, Vestal, and Robert B. Seminski, Endwell, both of N.Y., assignors to R.Q.O. Holding Company, Jamestown, N.Y.

Filed Sep. 20, 1983, Ser. No. 534,095
Int. Cl.³ G03D *7/00*; G03B *27/30*
U.S. Cl. 355—27 **15 Claims**



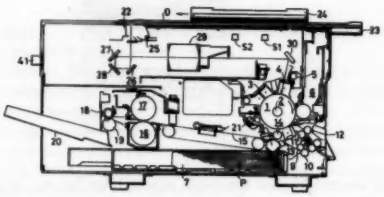
1. In a developing apparatus for photocopy machines comprising, in combination, a developing chamber having an inlet for receiving developing medium, an outlet for discharging said developing medium, means for transporting sensitized paper through the developing chamber and a vacuum pump in communication with the developing chamber to reduce the pressure within the developing chamber to a level below ambient pressure and thereby avoid external leakage of developing medium, the improvement which comprises:

a sealed fume collection chamber positioned adjacent to and in open contact with the means for transporting the sensitized paper; and open conduit means connecting the sealed chamber to evacuate collected fumes.

4,512,655
IMAGE REPRODUCING APPARATUS

Masato Ishida, and Hiroaki Takeda, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 434,250, Oct. 14, 1982, abandoned.
This application Apr. 25, 1984, Ser. No. 603,901
Claims priority, application Japan, Oct. 19, 1981, 56-16665
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—55 **10 Claims**



1. A variable magnification image reproducing apparatus comprising:

operable means for reproducing an original image, said operable means including a rotatable medium and means for changing a magnification of the original image to form an image having a changed magnification on said rotatable medium;

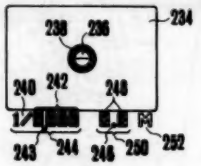
manual input means for selecting the magnification; and

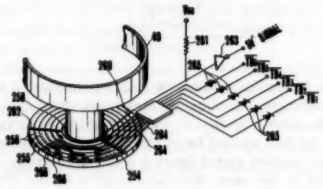
means for allowing entry of a signal for changing the magnification from said manual input means and for allowing an operation for changing the magnification by said magnification changing means in response to the signal from said manual input means while said rotatble medium is rotating and for allowing the entry of the signal for changing the magnification to another changed magnification while said magnification changing means is in operation.

4,512,656
CAMERA SYSTEM

Nobuhiko Shinoda, Tokyo; Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Tokyo; Tadashi Ito; Fumio Ito, both of Yokohama, and Hiroyashu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 737,771, Nov. 1, 1976, Pat. No. 4,304,472. This application Dec. 11, 1980, Ser. No. 216,070
Claims priority, application Japan, Nov. 8, 1975, 50-134391
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—475 **37 Claims**





1. A photographic camera comprising:

an exposure parameter indicating device including:

(a) at least one display unit having a plurality of light emitting elements each with a one-way conductive characteristic and arranged so as to represent a predetermined pattern;

(b) a plurality of switching elements connected to a corresponding light emitting element of said display unit so as to enable at least one light emitting element corresponding to said predetermined pattern; and

(c) timing pulse generating means having a plurality of timing pulse output lines connected to said display unit so as to apply a driving voltage in sequence to each of said light emitting elements having the one-way conductive characteristic;

said film speed information generating device including:

(a) a single data output line;

(b) a film speed dial having positions corresponding to a plurality of film speed information values;

(c) a digital data plate having a number of patterns corresponding to the positions of said film speed dial, each of the patterns of said digital data plate composed of a plurality of marks arranged to represent one of said film speed information values;

(d) detecting means having a plurality of electrical elements to receive the timing pulses from said timing pulse generating means and for detecting the marks on the digital data plate one after another in synchronism with each timing pulse, each of said electrical elements of said detecting means being connected to one of the timing pulse output lines of said timing pulse generating means corresponding thereto;

(e) means coupled to the detecting means for supplying output digital signals from said detecting means corresponding to each of the marks; and

(f) a plurality of diodes each connected between said

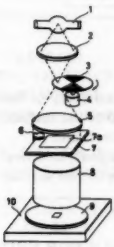
electrical elements corresponding thereto and the timing pulse output line corresponding thereto for preventing reverse current.

4,512,657

EXPOSURE CONTROL SYSTEM

Keiichiro Sakato, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,598
Claims priority, application Japan, Sep. 20, 1982, 57-162162
Int. Cl.[3] G03B 27/74
U.S. Cl. 355—68 3 Claims



1. An apparatus for controlling an exposure of an object to be exposed comprising:

(a) means for generating a radiation;

(b) means for directing said radiation from said radiation generating means to said object to be exposed, said radiation directing means including shutter means for opening and shutting a radiation path from said radiation generating means to said object to be exposed and thereby controlling the passage and interception of said radiation to said object;

(c) means for detecting an intensity of said radiation passed through said shutter means to generate detection signal indicative of said detected intensity;

(d) radiation measuring means responsive to said detection signal to measure an exposure value falling on said object from a start of an opening operation of said radiation path by said shutter means and generate an output signal indicative of an exposure value on said object;

(e) Shutter control means responsive to said output signal from said radiation measuring means to cause said shutter means to start shutting of said radiation path when the exposure value on said object reaches a predetermined value; and

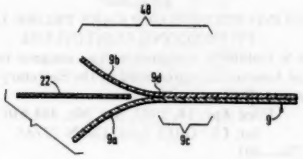
(f) radiation measurement control means for controlling a radiation measuring sensitivity of said radiation measuring means such that the exposure value measured by said measuring means during an interval between said start of opening of said radiation path by said shutter means and a completion of said opening represents a value indicative of a superposition of the exposure value on said object during the interval between said start of opening of said radiation path and the completion of said opening and the exposure value on said object during another interval between said start of shutting of said radiation path and a completion of said shutting.

4,512,658

ELECTROPHOTOGRAPHIC COPIER

Detlef Winkelmann, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,504
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214653
Int. Cl.[3] G03G 15/00, 27/00
U.S. Cl. 355—14 SH 17 Claims



1. An electrophotographic copier, comprising:

an exposing station having an entry zone with an entry plane on which an original to be copied is introduced into said entry zone; and

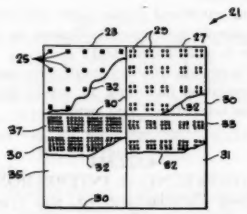
transport means for repetitively transporting an original through said exposing station from said entry zone, said transport means comprising: two film webs bonded at a joint seam to form a Y-shaped pocket for receiving a leading edge of an original to be copied, said Y-shaped pocket being positioned in said entry zone to receive an original to be copied from said entry plane; and means for closing said Y-shaped pocket on an original and drawing said film webs past said exposing station from said entry zone.

4,512,659

APPARATUS FOR CALIBRATING A SURFACE SCANNER

Lee K. Galbraith, and Jiri Pecen, both of Mountain View, Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed Aug. 10, 1983, Ser. No. 522,632
Int. Cl.[3] G01J 1/02
U.S. Cl. 356—243 6 Claims



1. A device for calibration of light-scattering test instruments of the scanning type comprising,

a substrate having a planar surface, and

a plurality of identical microscopic light-scattering elements disposed on said surface, said elements grouped in grid-like clusters, the mutual spacing between elements in all clusters being equal to a first dimension, said clusters spaced apart from each other by a second dimension, the second dimension substantially exceeding the dimension of an illuminating beam, the first dimension being less than the dimension of an illuminating beam, some of said clusters grouped in a grid-like array of clusters having the same first element density, corresponding to a light scattering cross section associated with a flaw of a certain size

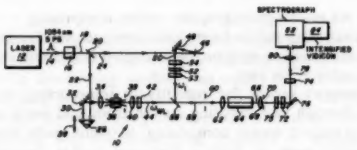
on said surface, said array positioned near other grid-like arrays of clusters, the other arrays each having clusters with the same element density within each array, different arrays having mutually different element densities and different from said first element density, said other densities corresponding to light scattering cross sections associated with flaws of other sizes on said surface, the grouping of arrays on the surface forming a pattern, said pattern repeated over said surface, with each pattern contiguous with at least one other pattern.

4,512,660

PICOSECOND BROADBAND CARS PROBE USING THE PICOSECOND CONTINUUM

Lawrence S. Goldberg, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1983, Ser. No. 484,810
Int. Cl.³ G01J *3/44*; G01N *21/65*
U.S. Cl. 356—301 **28 Claims**



1. A coherent anti-Stokes Raman spectroscopy (CARS) method for producing a picosecond broadband CARS vibrational spectrum of a sample comprising the steps of:

generating a probe pulse of coherent monochromatic radiation having a frequency ω_1, said probe pulse having a duration on the order of picoseconds;

generating a continuum pulse of broadband radiation, said continuum pulse having a range of frequencies ω_{WL} and a duration on the order of picoseconds, said range of frequencies ω_{WL} of said continuum pulse being related to said frequency ω_1 of said probe pulse such that the difference $\omega_1 - \omega_{WL}$ corresponds to a range of Raman active vibrational resonances in said sample;

spatially and temporally combining said probe pulse and said continuum pulse;

directing said combined probe pulse and continuum pulse into said sample to excite the Raman active vibrational resonances in said sample; and

detecting a beam of radiation emitted by said sample, said beam of radiation including an anti-Stokes spectrum of energy characteristic of said sample.

4,512,661

DUAL DIFFERENTIAL INTERFEROMETER

Richard O. Claus, Christianburg, Va., and Tyson M. Turner, Dallas, Tex., assignors to The United States of America as represented by the Aministration of the National Aeronautics and Space Administration, Washington, D.C.

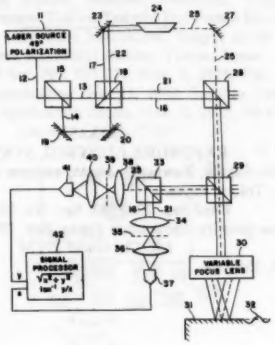
Filed Sep. 2, 1982, Ser. No. 414,237
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—351 **5 Claims**

1. A method for measuring both the amplitude and orientation of propagating, broadband ultrasonic surface waves comprising the steps of:

producing two pairs of laser beams including the step of orthogonally polarizing one pair with respect to the other;

focusing said two pairs of laser beams onto the ultrasonic surface waves to be measured such that the two beams in each pair of laser beams are one-half a wavelength of the ultrasonic surface waves apart and such that a straight line between the centers of the beams of one of said pairs of laser beams is perpendicular to a straight line between the centers of the other pair;

separating the reflected pairs of laser beams comprising the step of separating the two pairs of reflected beams in accordance with their polarizations;



detecting the separated pairs of laser beams to obtain two signals proportional to the surface wave motions along the two said straight lines; and

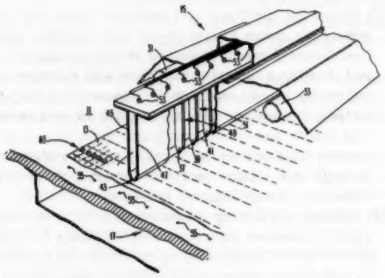
processing said two signals to obtain amplitude and orientation of propagation of the surface waves.

4,512,662

PLATE SCANNER FOR PRINTING PLATES

Philip E. Tobias, 1872 Watson Rd., Abington, Pa. 19001

Filed Jul. 6, 1981, Ser. No. 281,226
Int. Cl.³ G01B *11/28*
U.S. Cl. 356—380 **1 Claim**



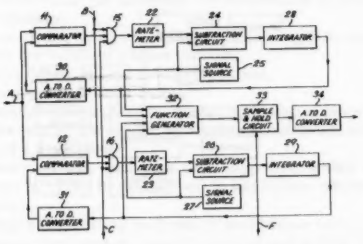
1. An arrangement for use with a printing press which has a reservoir means and a plurality of adjustable means, where each adjustable means controls ink flow from said reservoir means onto a different associated zone of a plurality of zones along a printing plate used with said printing press and which arrangement provides information which can be used to determne the amount of printing area in each of said zones comprising in combination: printing area reference means formed integral as part of said printing plate whereby light reflected from a printing area and from said printing area reference means is uniform; non-printing area reference means formed on said printing plate; image area means formed on said printing plate and including printing areas and non-printing areas; holder means formed to hold said printing plate; reading head means including light source means and a plurality of light sensitive diodes, said reading head means formed to include a plurality of walled chambers; each of said walled chambers

formed and disposed to define the width of an associated different one of said zones and formed to have an aperture therein lying substantially perpendicular to its associated zone; each of said light sensitive diodes disposed within a different one of said walled chambers to receive reflected light passing through said aperture of said associated walled chamber; said reading head means further formed and disposed to move over said printing area reference means, over said non-printing area reference means and over said image area means such that each of said walled chambers moves parallel to its associated zone and such that said light source means transmits light to said printing plate to effect reflected light therefrom, whereby each of said light sensitive diodes receives reflected light from along a different associated one of said zones to provide electrical signals indicative of the quantity of both printing areas and non-printing areas lying along said different associated one of said zones; means connected to said read head to transmit said electrical signals to data processing circuitry whereby for each of said zones, lying in the image area, the amount of printing area can be determined.

4,512,663
OPTICAL INSPECTION OF MACHINED SURFACES

Warren P. N. Bailey, High Wycombe, England, assignor to National Research Development Corporation, London, England

Filed Jan. 18, 1983, Ser. No. 459,032
Claims priority, application United Kingdom, Jan. 29, 1982, 8202552
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—446 **5 Claims**



1. In a method of inspection of a machined surface, which method comprises deriving an electrical test signal in respect of said surface by causing an illuminated spot formed by a beam of light to scan over said surface and detecting the resultant variations of the proportion of the incident light returned from said spot, and sensing excursions in said test signal corresponding to decreases of said proportion below a preset threshold level:

the improvement comprising setting said threshold level in accordance with the result of an analysis of an electrical signal derived in respect to said surface in a similar manner to that in which said test signal is derived, said threshold level being set substantially to the value given by the expression

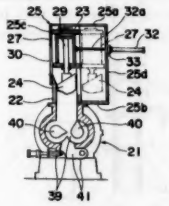
$$\frac{L_B \ln(N_A) - L_A \ln(N_B)}{\ln(N_A/N_B)},$$

N_A and N_B being different values of N, there N is the fraction of the total length of the scan for which the value of said proportion falls below a given level L, and L_A and L_B being the values of L which respectively correspond to N_A and N_B.

4,512,664
INTERNAL MIXER

Isao Oiwa, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Feb. 2, 1984, Ser. No. 576,427
Claims priority, application Japan, Feb. 7, 1983, 58-19430
Int. Cl.³ B29B *5/02*
U.S. Cl. 366—76 **4 Claims**



1. A machine for mixing a material which comprises:

a mixer body having a mixing chamber defined therein and accommodating therein at least one rotor for mixing the material within the mixing chamber, said body having a material inlet communicated to the mixing chamber;

a floating weight movable between lifted and lowered positions and operable to load the material into the mixing chamber as it moves from the lifted position towards the lowered position, said floating weight when in the lowered position closing the material inlet;

a fluid-operated cylinder assembly having a piston rod carrying said floating weight;

a support structure for supporting the fluid-operated cylinder assembly for movement between operative and stand-by positions in a direction generally perpendicular to the longitudinal axis of said cylinder assembly only when the floating weight is in the lifted position, said cylinder assembly when in the operative position being positioned immediately above the material inlet, but when the stand-by position, being positioned laterally offset with respect to the material inlet; and

a drive mechanism for driving the cylinder assembly between the operative and stand-by positions one at a time.

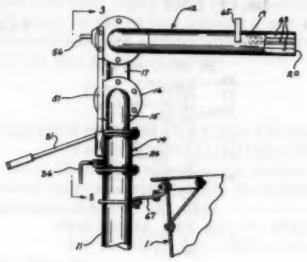
4,512,665
ADJUSTABLE OVER-THE-TOP AGITATOR FOR A LIQUID MANURE TANK

Kevin W. Cline, Arlington Heights, and Stephen L. Kretschmer, Elk Grove, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Aug. 15, 1983, Ser. No. 523,131
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—167 **7 Claims**

1. A manure agitation system, comprising an open top tank to contain liquid manure slurry and having an upper end, a generally vertical delivery pipe mounted on the exterior of the tank for conducting liquid manure upwardly to the top of the tank, a connecting conduit having a generally vertical end and a generally horizontal end, said horizontal end being disposed above the upper end of said tank, first swivel means for connecting said vertical end of said connecting conduit to the upper end of said delivery pipe, first locking means for locking said first swiveling means to prevent rotational movement between said connecting conduit and said delivery pipe, a generally L-shaped discharge nozzle disposed above the upper end of the tank, second swivel means connecting the horizontal end of said connecting conduit to one end of said discharge nozzle, the opposite end of said discharge nozzle being swingable in a vertical plane about said second swivel means, second locking means for locking said second swivel means and preventing relative rotational movement between the horizontal

end of said connecting conduit and said discharge nozzle, and biasing means associated with said second swivel means for biasing said opposite end of said discharge nozzle to a generally horizontal position, said first and second swivel means



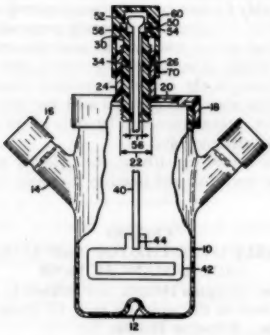
providing generally universal adjustment for the position of said discharge nozzle to thereby enable the stream of liquid manure being discharged from said nozzle to be selectively distributed to any desired location in said tank.

4,512,666

ADJUSTABLE HEIGHT MAGNETIC STIRRER

Dennis M. O'Connell, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1984, Ser. No. 583,576
Int. Cl.³ B01F *13/08*
U.S. Cl. 366—249 **3 Claims**



1. An improved magnetic stirring apparatus comprising: a vessel having walls, a bottom and an opening; a stirrer having a shaft and an attached magnetic impeller; a means for rotating the magnetic impeller; and a closure wherein the improvement is characterized by:

(a) a closure having an opening;

(b) a hollow adjustment support member dimensioned and configured to surround the opening in the closure:

(i) is connected to the closure about the opening;

(ii) upwardly projects from the closure; and

(iii) is at least partially threaded on the interior;

(c) a hollow sleeve being dimensioned and configured:

(i) with corresponding threads to screw into the adjustment support; and

(ii) with an interior diameter that can receive the shaft;

(d) an annular lower bearing surface:

(i) attached to the interior of the sleeve; and

(ii) having an opening dimensioned and configured to receive the shaft;

(e) a rotating upper bearing surface:

(i) having larger diameter than the opening in the lower bearing surface; and

(ii) which downwardly engages the lower bearing surface;

(f) the shaft:

(i) being connected to the upper bearing surface; and

(ii) projecting downwardly, through the lower bearing surface and the sleeve, into the vessel;

(g) an adjustment means having:

(i) an upper portion dimensioned and configured to engage a portion of the sleeve and permit the upper bearing to rotate;

(ii) a lower portion dimensioned and configured to slide over the exterior of the support; and

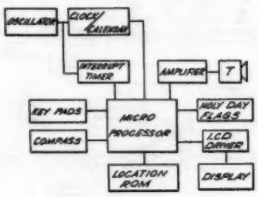
whereby when the means is placed over the support and engages the sleeve, the impeller height can be adjusted by turning the means.

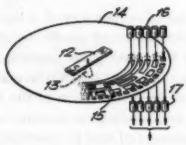
4,512,667

PORTABLE INFORMATION DEVICE HAVING AN OUTPUT RELATED TO NATURAL PHYSICAL EVENTS

Romm Doulton, Residence l'Annonciade, 17th Ave. de l'Annonciade, Apt. 30, 15th Floor, Monte Carlo, Monaco, and Robert A. Chapman, 27 Blyth Ave., Thatcham, Newbury, Berkshire, England

PCT No. PCT/GB82/00072, § 371 Date Nov. 1, 1982, § 102(e) Date Nov. 1, 1982, PCT Pub. No. WO82/03132, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 4, 1982, Ser. No. 440,223
Claims priority, application United Kingdom, Mar. 4, 1981, 8106859; Jun. 16, 1981, 8118453
Int. Cl.³ G04B *47/00, 47/06*
U.S. Cl. 368—10 **24 Claims**





1. A portable information device comprising means for establishing a time base; means for entering information identifying any one of a plurality of geographical locations; means associated with the time base establishing means and the information entering means for determining one or more points in time having a predetermined temporal relationship to the occurrence, at the location entered, of one or more natural physical events the time of which is dependent on geographical location; means for providing an output at the time determined; and means associated with the information entering means for providing a signal indicative of the deviation from a basic terrestial direction of the direction from the location entered towards a predetermined location; wherein there are provided magnetic compass means for ascertaining the basic terrestial direction, disc encoding means defining plurality of arcuate slots associated therewith and plurality of light sources

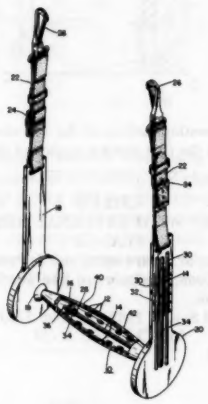
and receivers associated with the disc encoding means and with the deviation indicative signal to provide an output serving as a pointer towards the predetermined location.

4,512,668

THERMOMETER FOR OBTAINING THE TEMPERATURE OF HORSE

James M. Ivins, 112 Marengo St., Saint Michaels, Md. 21663

Filed Dec. 1, 1982, Ser. No. 446,025
Int. Cl.³ G01K *5/00*
U.S. Cl. 374—194 **7 Claims**



1. A thermometer for obtaining the temperature of a horse which comprises:

a hollow tubular bit means having sufficient length to extend across the width of a horse's mouth,

a support in said hollow tubular bit means,

a temperature indicating means,

said temperature indicating means including a reservoir within said hollow tubular bit means and connected to one end of a glass tube,

said reservoir and said glass tube supported within said tubular bit means by said support in said hollow tubular bit means,

said support supporting each end of said hollow tubular bit means, a rigid support secured to end of said hollow tubular bit means with said glass tube extending through said rigid support and along said support in said hollow tubular bit means,

a heat expansible fluid in said reservoir and a portion of the length of said glass tube,

a temperature scale positioned relative to said glass tube and calibrated to indicate temperature of the horse which is indicated at the highest level of said heat expansible fluid in said glass tube.

4,512,669

ROCK BIT BEARING PRESSURE EQUALIZATION SYSTEM

Leslie B. Moore, Red Oak, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

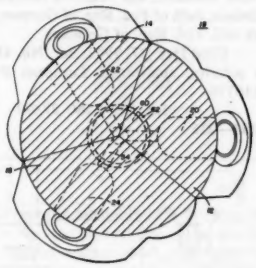
Filed Apr. 24, 1980, Ser. No. 143,394
Int. Cl.³ F16C *33/10*
U.S. Cl. 384—93 **1 Claim**

1. An improved multiple segment sealed bearing rotary bit, wherein each segment includes: bearing structure between a stationary bearing pin and a rotatably mounted cutter element thereon and wherein each bearing structure has a separate sealed lubricant system for providing lubrication to the respective bearing structure, said lubricant system comprising:

a seal ring in sealing engagement between each pin and cutter element for substantially sealing said bearing structure from external matter;

sealed lubricant reservoir means in each segment and containing lubricant;

a flexible diaphragm means in sealing relationship with each said reservoir means and having one face thereof exposed to ambient conditions external to said bit, said system providing a generally closed lubricant expansion volume whereby internal pressure, as by expansion of said lubricant forces said seal ring into a non-sealing position or ruptures said diaphragm and, wherein the improvement comprises:



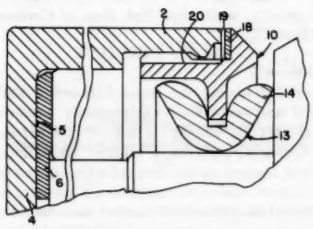
means providing fluid flow communication between each separate lubricant system of each segment whereby an expanded volume of lubricant in the system of one segment can be accommodated by the available volume in the system of any other segment to provide substantially equal lubricant pressure on the bearing structure of each segment and wherein said means providing fluid flow communication includes passages in each segment in alignment with like passages of each adjacent segment and wherein said aligned passages provide fluid flow communication between said lubricant reservoir means of said lubricant systems of adjacent segments.

4,512,670

SEALED BEARING CUP FOR UNIVERSAL JOINT

Armin Olschewski; Gerhard Herrmann, both of Schweinfurt, and Bernhard Bauer, Hassfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,436
Claims priority, application Fed. Rep. of Germany, May 15, 1982, 8214244[U]
Int. Cl.³ F16C *33/78*
U.S. Cl. 384—147 **7 Claims**



1. Sealed bearing cup, in particular, for universal joints which has a support body connected to the bearing cup and a seal ring fastened to this body having at least one axially elasti-

cally deformable sealing lip, characterized in the the support body (10) with the seal ring (13) is arranged axially slidable in the bore of the bearing cup (2) and is provided with a radially outward flange (17) which is located opposite the front face (16) of the bearing cup (2), said support body (10) at its outside surface having several axially directed grooves (20) distributed over the periphery and running from the front face (21) to the radial flange (17) of the support body (10).

4,512,671

BALANCING MACHINE BEARING MOUNTING FOR FLEXIBLE ROTORS

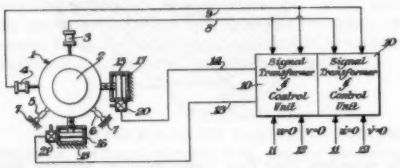
Alfred Giers, Rossdorf, and Manfred Heiland, Darmstadt-Neu-Kranichstein, both of Fed. Rep. of Germany, assignors to Carl Schenck AG, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 452,967

Claims priority, application European Pat. Off., Dec. 24, 1981, 81110778

Int. Cl.³ F16C *27/00*

U.S. Cl. 384—215 **8 Claims**



1. A balancing machine bearing mounting for flexible rotors with bearing heads for bearing journals of the flexible rotors and a foundation for supporting the bearing heads, characterized thereby that at least one measuring device per bearing journal is connected to the bearing head for determining the movement of the bearing head and/or bearing journal and generating a signal representative of that movement, means transmitting the measurement signal from the measurement device to a signal transformer for comparing the measurement signal with a reference value and generating a signal representative of that comparison, at least one power source connected to the bearing head, and means transmitting the comparison signal to the power source for inducing corresponding forces with given proportionality to the bearing heads and/or bearing journals.

4,512,672

FRONT SEAL FOR BEARING CUPS

Armin Olschewski; Gerhard Herrmann, both of Schweinfurt; Bernhard Bauer, Hassfurt, and Elisabeth Zirk, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

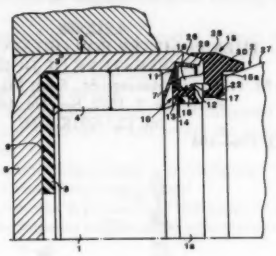
Filed May 27, 1983, Ser. No. 491,827

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 8213146[U]

Int. Cl.³ F16C *33/76*

U.S. Cl. 384—477 **6 Claims**

1. A seal for sealing the space between a shaft member having first and second circumferentially extending seating surfaces, the second seating surface being tapered and a cup member having an oppositely tapered circumferentially extending third seating surface formed adjacent the open end of the cup member, said seal comprising a member made of an elastic material of generally T-shaped cross section defining a body portion having a pair of oppositely directed sealing flanges projecting generally axially from said body portion and engageable with the second and third seating surfaces of the shaft member and cup member respectively, and wherein engagement of one of said sealing flanges with the second seating surface of the shaft effects a tilting action of said seal and a postiive sealing contact of said other sealing flange



against the third seating surface of the cup member, said body portion seating on the first seating surface of the shaft member.

4,512,673

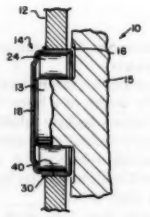
BEARING CUP WITH EXTERNAL RESTRAINING FLANGE

Charles E. Condon, Jr., Harwinton, and J. Peter Malik, Watertown, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Sep. 1, 1983, Ser. No. 528,603

Int. Cl.³ F16C *33/58*

U.S. Cl. 384—569 **3 Claims**



1. A bearing cup for rollers comprising: a cylindrical shell having at least one open end and an annular external restraining flange formed by longitudinally displacing a portion of the metal from one end of a cylindrical member having a constant outside diameter throughout its length, the annular external restraining flange separating the cylindrical shell into two sections of different outside diameters and having an annular surface extending substantially perpendicularly from the cylindrical shell smaller outside diameter section; and an inclined annular surface extending from the cylindrical shell larger diameter outside diameter section.

4,512,674

PRINTER CARTRIDGE AND CARTRIDGE RETAINING MEANS

Masayuki Suzaki, and Tetuo Kanno, both of Kanagawa, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 201,375, Oct. 27, 1980, abandoned. This application Aug. 4, 1982, Ser. No. 404,987

Claims priority, application Japan, Oct. 30, 1979, 54-150421[U]

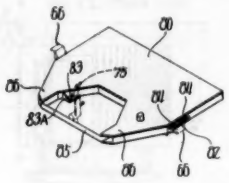
Int. Cl.³ B41J *32/00*

U.S. Cl. 400—208 **8 Claims**

1. In combination, a printing device and a ribbon cartridge pivotally mounted on a first member of said printing device for pivoting travel about a pivot axis between a predetermined position and a printing position,

wherein said ribbon cartridge comprises a cartridge body and an engaging member extending from said cartridge body at a location remote from said pivot axis,

wherein said printing device further comprises means for causing said pivoting travel of said cartridge, an upper stopper member mounted on a second member of said printer proximate said engaging member of said cartridge,



said upper stopper member comprising first and second contacting means for contacting said engaging member of said cartridge during said pivoting travel when said cartridge reaches said predetermined position and said printing position, respectively, wherein said first and second contacting means comprise means for establishing the limits of said pivoting travel of said cartridge.

4,512,675

SERIAL PRINTER

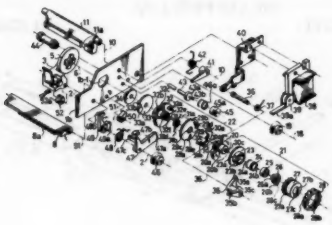
Fumihisa Hori; Tadao Tamukai, both of Tamayama, and Mikio Miyajima, Nishine, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 178,891, Aug. 18, 1980, Pat. No. 4,414,893. This application May 31, 1983, Ser. No. 499,559

Claims priority, application Japan, Aug. 20, 1979, 54-105673

Int. Cl.³ B41J *19/68*

U.S. Cl. 400—328 **7 Claims**



1. A printer including a carriage carrying at least one type wheel having a plurality of type elements around its circumference; means for moving said carriage along a line to be printed against a force urging said carriage to its initial position; said moving means including a gear element carried rotatably by said carriage for movement therewith along a line to be printed and having a cam surface, said cam surface including a first section extending substantially over half the circumference of said gear element and extending along the direction of rotation thereof, and a second section extending obliquely to the direction of rotation, a rack positioned along the path of movement of said carriage to mesh with said cam surface to move said carriage along said rack, and means for rotating said gear; and means for rotating said rack out of engagement with said gear to allow said carriage to return to its initial position.

4,512,676

LOCKING ASSEMBLY FOR RESTRICTING PIVOTAL MOVEMENT OF A PRINT UNIT TO A POSITION IN WHICH A PRINT ELEMENT CAN BE REPLACED

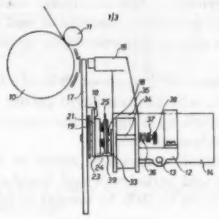
Hans L. Johansson, Karlshamn, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Apr. 28, 1983, Ser. No. 489,310

Claims priority, application Sweden, May 5, 1982, 8202814

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **8 Claims**



1. In an apparatus for the assembly of a printing apparatus for an electric office machine comprising a print unit including an electric motor having a drive shaft and a disk-like type element removably secured to said shaft, said print unit being pivotably movable between a printing position, in which said element is drivingly coupled to said shaft, and a pivoted position in which said element is disengaged from said shaft for replacement, and locking means for permitting pivotal movement of the print unit from said printing position to said pivoted position only when said type element is in a predetermined angular position, the improvement wherein the locking means comprises a lock collar member rigidly attached to the motor shaft and having an end face, and a disengagement means including a disengagement member facing said end face of said collar member and displaceable axially of said shaft towards said collar member during pivotal movement of the unit, one of said members including a plurality of axially extending pins, the other member being provided with a plurality of complementary recesses which are in engagement with said pins only when said type element is in said predetermined annular position, the pivotal movement of said unit to said pivoted position being permitted only with said pins engaged in said recesses.

4,512,677

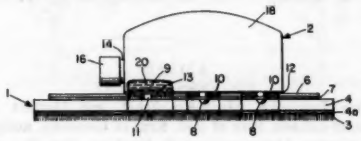
NO RINSE LIQUID CAR CLEANER KIT WITH LIQUID CLEANER AND BRISTLE PAD

Toan Trinh, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 26, 1982, Ser. No. 401,805

Int. Cl.³ A46B *1/00;* **B08B** *1/00, 3/00;* **C11D** *3/12*

U.S. Cl. 401—27 **6 Claims**



1. A car cleaner kit comprising a dispenser containing a predetermined amount of a liquid car cleaner composition and a pad for applying said liquid car cleaner on said car, said pad having resilient fibers and a base, said fibers attached substantially vertically to said base, said fibers having a length of from 3 to 15 mm, a diameter of from 10 to 150 microns, said fibers being attached to said base at a density of at least 500 fi-

bers/cm^2, said base having a minimum surface area of 60 cm^2, said pad has a Yield Force of at least 36 Newtons, said liquid cleaner having:

I. from 0.1% to 30% by weight of insoluble organic polymeric solids selected from the group consisting of:

A. polymeric particles of particle size in the range of from 1 micron to about 250 microns;

B. polymeric fibers of diameter between 1 micron and 50 microns, and length between 0.1 millimeter to 3 millimeters;

said polymeric solids can consist essentially of up to 100% of said polymeric particles at said 30%, said polymeric solids can consist essentially of 100% of said fibers at 10%;

II. from about 20% to about 95% of a liquid carrier for said particles, wherein said liquid carrier contains from about 10% to 90% by weight of the composition of an aliphatic hydrocarbon solvent;

III. an organic suspending agent in sufficient amount to suspend said particles in said liquid carrier; and

IV. from 0.1% to 20% by weight of silicone.

4,512,678

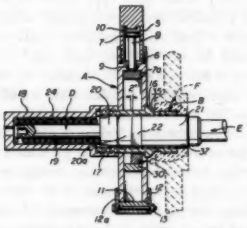
SLIDE RELEASE MECHANISM

James W. Bunker, Canyon Country, and Robert S. Ritchie, Valencia, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1982, Ser. No. 393,584

Int. Cl.^{3} F16B *1/00*

U.S. Cl. 403—15 **7 Claims**



1. A releasable support device comprising a body having an opening in a wall thereof, a load-carrying part extending through said opening into said body, a latch part slidable in said body, said load-carrying and latch parts having cooperating elements for, respectively, latching and releasing said load-carrying part as said latch part is shifted, means to shift said latch part, and means actuable as said load-carrying part is released to close said body opening, said means actuable also includes a portion following said load-carrying part for closing said body opening as said load-carrying part is expulsed from said body.

4,512,679

UNIVERSAL JOINT

Miloslav Petrzelka, Much-Kranüchel, and Herbert Taureg, Hennef-Löbach, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Aug. 3, 1982, Ser. No. 404,891

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131000

Int. Cl.^{3} F16D *3/00*

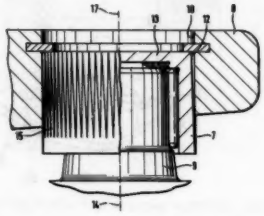
U.S. Cl. 403—57 **5 Claims**

1. A universal joint having a joint center comprising:

yoke means having a bore therein adapted to receive the journal of a cross member, said bore having an inner surface;

a cross member including a journal having a journal axis received in said bore of said yoke means;

bearing means including a bearing bush having an outer surface operatively positioned within said bore between



said yoke means and said journal engaged with a press fit between said outer surface and said inner surface; and

grooves formed in at least a part of at least one of said inner surface of said bore and said outer surface of said bearing bush, said grooves extending generally parallel to said journal axis and having an increasing depth with increasing distance from said joint center.

4,512,680

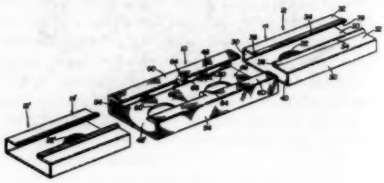
CHANNEL CONNECTOR

Walter Tomaszewski, Canton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 23, 1984, Ser. No. 602,864

Int. Cl.^{3} F16B *2/02*

U.S. Cl. 403—313 **11 Claims**



7. A channel connector comprised of a flexible resilient material, of a generally rectangular form in a transverse cross section, of a predetermined axial extent having:

(a) a substantially flat bottom wall, similarly projecting side walls and top walls, parallel to said bottom wall, said top walls being separated by a continuous central longitudinal slot;

(b) transverse abutment means, having first and second opposed sides, emanating from said top walls, at about the midpoint of said channel connector axial extent; and

(c) said bottom wall having one or more apertures of a predetermined size whose axially outermost extents, relative to said abutment means, are equally axially spaced from said first and second opposed sides of said abutment means.

4,512,681
TAPER BUSH

Gordon A. Hayhurst, Hessle, and David A. Rayner, Burton Pidsea, both of England, assignors to J.H. Fenner & Co. Limited, England

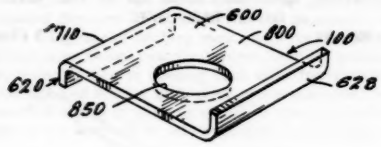
Filed Jul. 31, 1981, Ser. No. 288,754
Claims priority, application United Kingdom, Aug. 5, 1980, 8025499
Int. Cl.³ F16B 2/00
U.S. Cl. 403—371 14 Claims

1. In a tapered, longitudinally-split contractable taper bush for securing pulleys, sprockets, coupling flanges or other machine elements onto cylindrical shafts and wherein the bush has a central axis and three holes extending axially of the bush at angularly spaced locations about said axis for receiving screws or bolts parallel to said axis for wedging the bush between the element to be secured and a shaft positioned axially within the bush and wherein the bush has a longitudinal slit extending throughout the axial length of the bush at a location between two of the holes opposite the third hole in the bush, the improvement comprising an enlargement of the longitidunal slit wherein the enlargement is of predetermined size and distance from said axis to impart substantial rotational balance to the bush and the element and shaft to be associated therewith during use thereof.

4,512,682
ALIGNMENT CONTROL DEVICE

Edwin M. Mungons, 5906 Cresthaven (Apt. D-1), Toledo, Ohio 43614

Continuation-in-part of Ser. No. 418,405, Sep. 15, 1982,. This application Jul. 8, 1983, Ser. No. 511,920
Int. Cl.³ F16B 7/00
U.S. Cl. 403—390 1 Claim



1. An adapter device for stabilizing two members relative to one another in order to prevent pivotal movement, said device comprising:

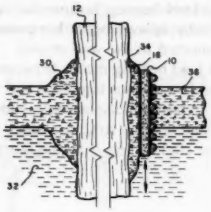
(a) a plate member having an upper surface and a lower surface with a bore in said plate extending from the lower surface to the upper surface, and said plate having four edges forming the perimeter of said plate disposed on respective opposing sides of said plate, and wherein the bore in said plate is disposed in a position offset from the geometrical center of said plate toward one corner of said plate

(b) first and second flange members disposed along the full length of opposing edges of said plate member, wherein the first flange member is disposed away from the upper surface of said plate in a direction opposite to the direction of said second flange member.

4,512,683
PILING PROTECTOR

Marino Cosenza, 351 Poplar Ave., Linwood, N.J. 08221

Filed Sep. 19, 1983, Ser. No. 533,655
Int. Cl.³ E02D 5/60
U.S. Cl. 405—216 6 Claims



1. Means for protecting a piling from being lifted by rising ice as the tide rises including:

a substantially tubular sleeve member having a constant and uniform inner diameter greater than the diameter of the piling being protected;

said sleeve member having an outer casing with an uneven surface and a layer of rigid solid material inwardly, said uneven surface having a plurality of raised portions and a plurality of valleys so that ice forming therearound will tightly grip the sleeve member;

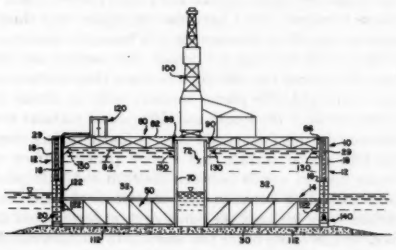
the average density of the sleeve member being slightly less than that of water so that the same floats in water with a small portion thereof being above the water level;

the innermost surface of the sleeve member facing said piling being even, continuous and smooth whereby said sleeve member is capable of easily sliding up or down across any ice which may form around said piling and between the piling and the sleeve member.

4,512,684
MOBILE OFFSHORE STRUCTURE FOR ARCTIC EXPLORATORY DRILLING

David R. Hale, Elmhurst; William A. Owen, Lombard, and James A. Orndorff, Jr., Glen Ellyn, all of Ill., assignors to CBI Offshore, Inc., Oak Brook, Ill.

Filed Jun. 13, 1983, Ser. No. 503,703
Int. Cl.³ E02B 15/02
U.S. Cl. 405—217 18 Claims



1. An offshore exploratory drilling floatable structure ballastable to rest on a sea floor but to extend above water level when so supported and adapted to withstand arctic ice loads, comprising:

a wall means having an outer substantially vertical cylindrical shell and an inner substantially vertical cylindrical shell;

the inner shell being positioned radially inwardly of the

outer shell with the inner and outer shells having a common vertical axis thereby defining an annular space between the inner and outer shells;

reinforcing means, in the annular space, extending between the inner and outer shells in the lower portion thereof which may be subjected to arctic ice loads when the structure rests on a sea floor;

a structural load bearing bottom having a pair of substantially equally spaced apart horizontal upper and lower discs connected to the wall means;

a structural load bearing means between and connecting the upper and lower discs together; and

a floatable vertically displaceable substantially horizontal circular load bearing structural deck inside of and having a diameter slightly less than the inner shell.

4,512,685

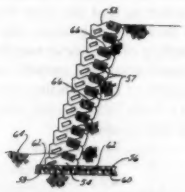
MORTARLESS RETAINING-WALL SYSTEM AND COMPONENTS THEREOF

Richard L. Hegle, Honolulu, assignor to Ameron, Inc., Monterey Park, Calif.

Filed Sep. 8, 1981, Ser. No. 300,308

Int. Cl.³ E02D *17/20*

U.S. Cl. 405—284 **28 Claims**



1. A building block made of concrete or the like comprising a front face, a back face, a top face, a bottom face, and a pair of side faces; the top face having a convex first surface comprising first and second planar surfaces with an obtuse convex vertex between the first and second planar surfaces extending between the side faces and a concave second surface comprising the second planar surface and a third planar surface with an obtuse concave vertex between the second and third planar surfaces extending between the side faces, the concave second surface lying between the convex first surface and the front face; the bottom face having a concave third surface comprising fourth and fifth planar surfaces with an obtuse concave vertex between the fourth and fifth planar surfaces extending between the side faces, and a convex fourth surface comprising the fifth planar surface and a sixth planar surface with an obtuse convex vertex between the fifth and sixth planar surfaces extending between the side faces, the convex fourth surface lying between the concave third surface and the front face, the convexity of the first and fourth surfaces matching the concavity of the third and second surfaces, respectively, wherein the concave second surface on the top face of the block has a smaller included angle than the convex first surface on the top face, so that the first and third planar surfaces coverge toward the front face of the block and wherein the convex third surface on the bottom face of the block has a larger included angle than the concave fourth surface on the bottom face of the block so that the fourth and sixth planar surfaces coverge toward the front face of the block at the same angle as the first and third planar surfaces converge.

4,512,686

ROOF SUPPORT SUITABLE FOR USE IN MINES

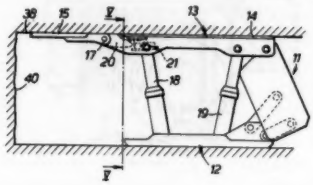
John H. Waters, Cheltenham, England, assignor to Dowty Mining Equipment Limited, England

Filed Mar. 27, 1984, Ser. No. 593,818

Claims priority, application United Kingdom, Apr. 16, 1983, 8310348

Int. Cl.³ E21D *15/44, 17/054*

U.S. Cl. 405—293 **9 Claims**



1. A roof support, suitable for use in mines, including a floor-engaging structure, extendible and contractible prop means carried by said structure, a roof-engageable canopy, supported by said prop means, which comprises a main portion and an extension portion pivotally-connected to the main portion, actuator means carried by said main portion, and a wedge member so carried by said main portion and so connected with the output member of said actuator means as to be slidable, upon operation of said actuator means, lengthwise of said main portion, the end portion of said wedge member remote from said actuator means having a wedging face which is co-operable with a complementary face formed on a part of said extension portion which projects substantially beyond the pivotal connection in the direction towards said actuator means, whereby sliding movement of said wedge member effects tilting of the extension portion with respect to said main portion.

4,512,687

CONVEYOR ASSEMBLIES FOR DETACHABLE MOUNTING TO A TRACTOR

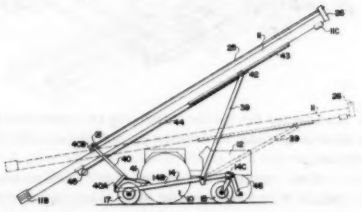
Silvanus T. Enns, 14-224 Kennedy St., Winnipeg, Manitoba, Canada R3C 1T1

Filed Mar. 21, 1983, Ser. No. 477,320

Claims priority, application Canada, Apr. 16, 1982, 401170

Int. Cl.³ B65G *53/48*

U.S. Cl. 406—41 **9 Claims**



1. An auger for mounting to an associated tractor, having a longitudinal axis along which it normally moves, a drawbar hitch and a PTO at a rear position thereof in side by side relationship therewith, said assembly comprising in combination a freestanding tricycle undercarriage including a frame having a rear axle member arranged transverse to a longitudinal axis of said auger, a pair of spaced apart rear ground engaging wheels on respective ends of said axle member and a front castor wheel assembly mounted to said frame forwardly of said

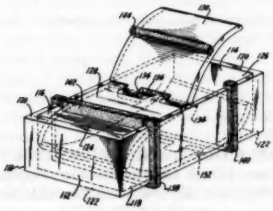
axle member, an auger tube having an inlet end and a discharge end and arranged substantially along said auger axis with said discharge end forwardly of said axle, means mounting said auger tube on said undercarriage for movement thereof so as to raise and lower said inlet and discharge ends from a transport position to various working positions and vice-versa, said frame including hitch means connected to said transverse axle member adjacent one rear wheel thereof and extending forwardly therefrom for connection to said drawbar hitch and interconnecting means arranged generally transverse to said auger axis and attached to said frame forwardly of said axle for connecting said frame to said tractor at a position thereof forwardly of said drawbar hitch whereby, when connected, said tractor can move said auger with the auger axis held parallel to the tractor axis, and drive connection means for taking drive from said PTO to drive said auger.

4,512,688

PNEUMATIC TUBE SYSTEM WITH CARRIER

Hans Hochradel, 89 Minnehaha Blvd., Lake Hiawatha, N.J. 07034

Filed Jan. 27, 1983, Ser. No. 461,680
Int. Cl.³ B65G *51/32*
U.S. Cl. 406—111 **14 Claims**



1. A carrier for a pneumatic tube system comprising a rigid frame defining a single undivided chamber, said frame comprising spaced end sections, a pair of spaced side members, a top, and a bottom, said frame when viewed along the axis of the carrier's intended direction of movement in the pneumatic tube substantially complementing the cross-section of the pneumatic tube, a pair of doorways formed on at least one of the top or bottom, a door pivotably mounted in each of the doorways for swinging movement between open and closed positions about an axis which is perpendicular to the carrier's intended direction of movement in the pneumatic tube, said doors being free of latching means with the pivotal mounting of each door being inwardly disposed from the end sections of the frame so that in opening each door freely swings away from one end section, and spring means associated with each door and urging the door to assume an open position when the door is not confined by said pneumatic tube system.

4,512,689

CUTTING INSERT AND CUTTING TOOL THEREFOR

Sven O. Bylund, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Feb. 23, 1983, Ser. No. 468,939
Claims priority, application Sweden, Apr. 1, 1982, 8202092
Int. Cl.³ B26D *1/12*; B23P *15/28*; B23D *77/00*; B27G *15/00*
U.S. Cl. 407—40 **11 Claims**

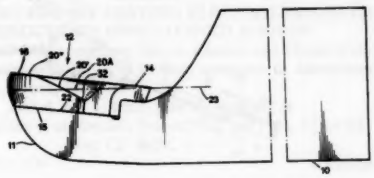
1. A cutting tool for the chipforming machining of workpieces, comprising:

a tool body rotatable in a direction of rotation about a longitudinal axis thereof, a longitudinally forward cutting end of said tool body including a recess having a support surface,

a cutting insert mounted in said recess and including:

first and second side surfaces spaced apart in said direction of rotation, said first side surface resting against said support surface of said recess and trailing said second side surface with reference to said direction of rotation, and

a convex cutting edge including a forward portion and a rear portion, said forward portion lying substantially in a plane defined by said second side surface and having a radially inner end located at a forward end of said second side surface and adjacent said axis, said forward portion extending radially outwardly and longitudinally



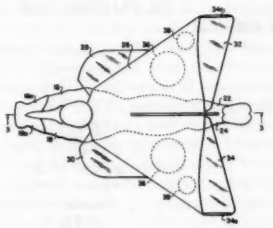
rearwardly and merging with said rear portion at a location spaced radially outwardly from said axis, said rear portion extending from said location along a path formed by components directed radially outwardly, longitudinally rearwardly, and toward said first side surface, respectively, such that a radially outer end of said rear portion is disposed longitudinally rearwardly of said radially inner end and closer to said first side surface than said radially inner end.

4,512,690

FLYING FIGURE TOY GLIDER

Mark E. Johnson, 122-C Trellis La., Escondido, Calif. 92026

Filed Nov. 14, 1983, Ser. No. 550,796
Int. Cl.³ A63H *27/00*
U.S. Cl. 446—61 **17 Claims**



1. A toy flying figure glider, comprising:

a lightweight body formed in an outstretched configuration having a head, a pair of forwardly extending forward limbs, and a pair of rearwardly extending rear limbs,

a wing structure attached to the back of said body for supporting said body in flight in an airborne configuration, and

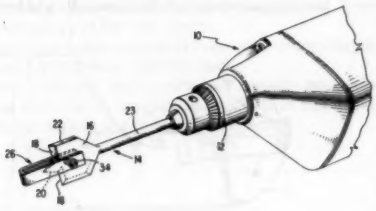
said wing structure comprising an opaque portion, said portion being arranged to have symmetry with respect to the length of the body, providing a wing area and simulating an outstretched cape worn by the body, and transparent means for inconspicuously expanding said wing area, said transparent means extending beyond the edges of said opaque portion and continuing said symmetry.

4,512,691

PILOT ADAPTOR FOR FLAT WOOD BORING BITS

William C. Dicke, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed May 19, 1983, Ser. No. 496,141
Int. Cl.³ B23B *51/60*
U.S. Cl. 408—201 **5 Claims**



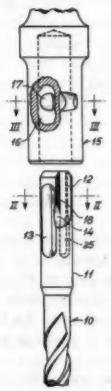
1. A pilot adaptor for a flat wood boring bit having a shank extending to two parallel flattened sides with an axially aligned orifice extending therebetween and terminating in opposed cutting edges on each side and rearwardly of a pilot tip, said pilot adaptor to accommodate said flat wood boring bit to a smaller pilot hole to enable said flat wood boring bit to drill a larger hole concentric to said pilot hole, said pilot adaptor comprising: an elongated rectangular sheet metal member bent substantially centrally thereof to form two parallel legs for receiving said parallel flattened sides of said flat wood boring bit therebetween, said parallel legs having parallel sides with diagonally opposite edges spaced apart the diameter of said pilot hole so that said legs are received therein, and means for supporting said pilot adaptor axially of said flat wood boring bit.

4,512,692

TOOL SHAFT FOR A TOOL OF THE PERCUSSIVE AND ROTATIVE TYPE

Mogens B. Nielsen, Glostrup, Denmark, assignor to Durofac-Kartro A/S, Valby, Denmark

Filed Jul. 19, 1982, Ser. No. 399,284
Claims priority, application Denmark, Jul. 24, 1981, 3335/81
Int. Cl.³ B23B *31/06*
U.S. Cl. 408—226 **9 Claims**



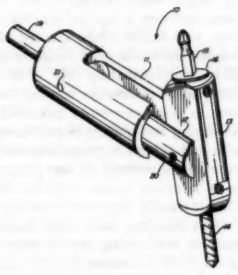
1. In a tool shaft configuration for a tool of the percussive and rotative type and having a substantially cylindrical end portion adapted to be releasably received within a cylindrical bore of a tool holder having at least one driving member extending radially into the bore, the cylindrical end portion of the shaft comprising at least one pair of axially coextending, peripherally off-set first and second recesses interconnected by a peripherally extending third recess, the first recess extending from the free end of the cylindrical end portion and the second recess having closed axially opposite ends and driving surface for drivingly engaging with a driving element of the tool, each of said first, second, and third recesses being adapted to slidably receive the driving member of the tool holder therein when the tool shaft is inserted in the holder, the improvement that the surface part defining the first recess is shaped so as to define between the pair of first and second recesses a separating shaft portion having a radially outward surface part substantially coinciding with the cylindrical outer surface of the cylindrical end portion, and wherein the peripherally extending third recess is connected to the second recess at a position spaced from the ends thereof, and that the first recess includes an extension extending axially beyond the position at which the second recess is connected to the first recess, whereby said tool shaft can be accommodated by socketed tool holders having fixed or radially extensible protuberances or both.

4,512,693

REVERSIBLE DRILL AND DRIVE TOOL HOLDER

Carl A. Swanson, 1351-B Chesapeake Ave., Naples, Fla. 33942

Filed Dec. 27, 1982, Ser. No. 453,522
Int. Cl.³ B23B *31/04*
U.S. Cl. 408—239 R **5 Claims**



1. A reversible drill and drive tool holder comprising: a hollow cylindrical locking sleeve having its open forward end forked to form a yoke with cylindrical interior sides and an axially bored cylindrical hole in its rear end,

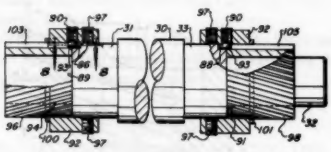
an elongated cylindrical shaft lying axially slidable partially within said sleeve and having a rear end of reduced diameter projecting through the hole in the rear end of the sleeve for insertion into the chuck of a drill and a forward end forked to form a yoke with parallel flat interior sides, an elongated two-ended tool holding member rotatably pinned at its center between the parallel flat sides of the yoke of said shaft, and

spring loaded means lying along the axis of the cylindrical shaft for locking said tool holding member into axial alignment with said sleeve and shaft by retaining the rearmost end of the tool holding member within the cylindrical interior of the front end of the sleeve.

4,512,694
METHOD AND APPARATUS FOR ALIGNMENT OF GEARING

Charles D. Foran, Dallas, and Jack D. Smith, The Colony, both of Tex., assignors to Associated Dynamics, Incorporated, Addison, Tex.

Filed Feb. 1, 1982, Ser. No. 344,383
Int. Cl.³ B23F 3/00
U.S. Cl. 409—12 24 Claims



1. A method of aligning at least one set of gears of a gear drive arrangement having a first set of gears mountable spaced apart on a first shaft so that each of said gears of said first set may be meshed with respective ones of a second set of gears mounted spaced apart on a second shaft substantially parallel to said first shaft whereby a driving load is transferred substantially evenly from said first set of gears to said second set of gears, said method comprising the steps of:

(a) providing one of said shafts with one of said sets of gears formed integral with said one shaft and aligned with each other so that the teeth of one of said gears of said one set are positioned in a predetermined relationship with the teeth of the other of said gears of said one set by:

(1) providing said one shaft with opposed recess means of predetermined dimensions formed spaced apart on said one shaft in predetermined alignment with each other;

(2) providing a first gear master part having at least one set of opposed tooth flanks forming at least one tooth space of predetermined proportions;

(3) providing a first fixture for holding said first gear master part and mountable on said one shaft, said first fixture including locating pin means thereon;

(4) mounting said first gear master part on said shaft in a predetermined position as determined by one of said recess means;

(5) mounting said first fixture on said one shaft with said locatingl pin means disposed in said one of said recess means and in a tooth space for locating said first gear master part in a predetermined position with respect to said one shaft prior to locating a cutting tool in said tooth space;

(6) premarking said tooth flanks of said first gear master part to indicate contact with said cutting tool and adjusting the position of said cutting tool with respect to said tooth flanks so as to substantially center said cutting tool in a tooth space on said first gear master part;

(7) positioning said cutting tool in said tooth space to locate said cutting tool with respect to at least one of said flanks and said one shaft for cutting said teeth of one of said gears of said one set in a predetermined alignment with respect to said one shaft;

(b) providing the other of said shafts with spaced apart alignment means aligned with each other;

(c) providing all gears of said other set with hubs for mounting said gears of said other set on said other shaft;

(d) providing a second fixture including means engageable with corresponding points on the profile faces of adjacent gear teeth, said second fixture including means for locating a reference point on said hubs;

(e) mounting said second fixture on each of said gears of said other set and marking each hub to locate alignment means on each hub on the basis of the location of said means on said second fixture for locating said reference point on said hub;

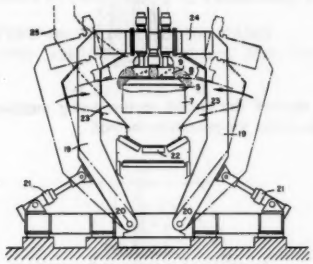
(f) providing alignment means in each of said gears of said other set based on the location of said marks; and

(g) mounting said gears of said other set on said other shaft with said alignment means on said gears of said other set aligned with respective alignment means on said other shaft.

4,512,695
APPARATUS FOR SEPARATING ELECTROLYSIS BATH RESIDUES ON PRECALCINED ANODES

Marcel Brun, Asnieres; Andre Perret, Chatou, and Claude Cailleux, Combs-la-Ville, all of France, assignors to Aluminium Pechiney, Lyons, France

Filed Jul. 1, 1982, Ser. No. 394,467
Claims priority, application France, Jul. 23, 1981, 81 14792
Int. Cl.³ B23C 3/14
U.S. Cl. 409—134 6 Claims



1. An apparatus for removing electrolysis bath residues from at least one used anode unit removed from an electrolysis cell for the production of aluminum by the Hall-Heroult process, wherein said at least one anode unit comprises a carbon residue, a plurality of studs sealed within said carbon residue, a suspension rod having flanges welded thereon, said flanges interconnecting said studs, and electrolysis bath residues on the surface of said unit, said apparatus comprising gripping and positioning means for said at least one anode unit including two arms having clamping jaws engagable with said suspension rod, means pivotally supporting said arms for swinging in a plane, a rotary milling cutter having an axis of rotation substantially parallel to the axis of said suspension rod, gripping and moving means for said rotary milling cutter comprising at least one pivotal arm located in a plane substantially transverse to the plane of said two pivotal arms, hooding means for collecting and extracting dust, and means for conveying the removed electrolysis bath residues, wherein the position of said cutter with respect to said anode unit is movable enabling said rotary milling cutter to pass successively between the studs and around the studs.

4,512,696
DRAW BAR FOR MACHINE TOOL

Mirko Cukelj, 11459 Chapin St., Chesterland, Ohio 44092

Filed Jul. 5, 1983, Ser. No. 510,987
Int. Cl.³ B23B 31/10
U.S. Cl. 409—233 4 Claims

1. A draw bar for collet chucking spindles comprising an elongated body having a wrench head at one end, first and second thread sections for collet operation at the opposite end, said first and second thread sections being of like configurations, means defining said sections to be separate, said sections being initially integral, said first section being at the extremity and subject to initial use for collet actuation, removal of said

first section being effected by severing the same from the second section when thread wear diminishes the actuating

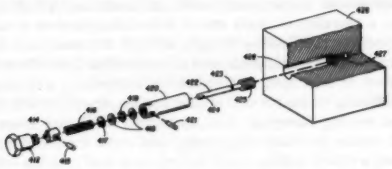
power thereof, the second section being thereby engageable with the collet for operation thereof.

4,512,697

TORQUE LIMITING FASTENER

Michael R. Cascini, Hudson, N.H., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 22, 1983, Ser. No. 468,254
Int. Cl.[3] F16B *31/02*
U.S. Cl. 411—7 3 Claims



1. A fastener comprising in combination:

a. a first assembly having a threaded region and an additional frictional region having a specified rotational friction characteristic;

b. a second assembly rotatably coupled to said first assembly and having a fastening configuration in one region thereof and an additional region in a proximal cooperating relationship with said frictional region of said first assembly; and

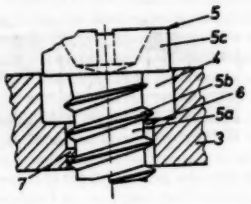
c. a threaded fastener for joining a first apparatus to a second apparatus wherein said fastening configuration of said second assembly is for connection to said second apparatus and is torque limited, preset, and including means for controllably joining said frictional region of said first assembly to said additional region of said second assembly, having a predetermined joining force and means for adjusting said predetermined joining force during assembly of said fastener, and means for preventing adjustment subsequent to assembly, said threaded fastener for connection to said first apparatus, and said first assembly for coupling said threaded fastener to said second assembly.

4,512,698

HOLDING MECHANISM, IN PARTICULAR FOR SKI BINDINGS

Al-Madhi Muad, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Feb. 9, 1983, Ser. No. 465,121
Claims priority, application Austria, Feb. 12, 1982, 548/82
Int. Cl.[3] F16B *21/00, 37/00*
U.S. Cl. 411—337 2 Claims



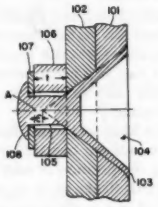
1. In a base member having a generally cylindrical bore for receiving a fastening screw, wherein the surface of the bore, for holding the fastening screw, has two shoulders which are offset circumferentially and axially in said bore relative to one another, the improvement comprising wherein each said shoulder, viewed in an axial direction, is defined by two nested circles of different radius, the larger radius being equal to the radius of said bore and the circles contacting one another substantially tangentially at a contact point, and wherein the contact points of the circles of the respective shoulder are angularly offset by 180° relative to one another.

4,512,699

DAZE FASTENERS

L. Robert Jackson, Newport News; Randall C. Davis, Poquoson, and Allan H. Taylor, Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 17, 1983, Ser. No. 495,380
Int. Cl.[3] F16B *33/00, 35/04*
U.S. Cl. 411—368 7 Claims



1. A fastener for connecting two or more structural elements having mating frusto-conical apertures therethrough to receive the fastener and wherein the structural elements and fastener have substantially different coefficient of thermal expansion physical property characteristics comprising:

a first elongated fastener element having an elongated body portion and an integral head portion formed on said elongated body portion;

said elongated body portion being positioned within and extending through the structural elements to be connected thereby and said head portion being provided with a frusto-conical exterior surface and being received in mating surface contacting engagement with the frusto-conical apertures formed in the structural elements to be con-

nected thereby and wherein the mating surfaces consist of line elements that when extended form a vertex;

a spacer washer element disposed about said elongated body portion and in engagement with one of said structural elements to be connected;

a metal washer also disposed about said elongated body portion and in engagement with said spacer washer wherein the contacting surfaces of said metal washer and said spacer washer are on a plane that passes through the vertex formed by line element extensions of the mating surfaces of said frusto-conical head and said frusto-conical apertures; and

means firmly engaging said metal washer to force said metal washer against said spacer washer and retaining the structural elements fastened together.

4,512,700

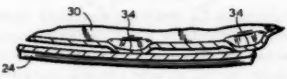
NESTING DRUMS-METHOD OF MAKING THE SAME

Cesar Santoni, Hamilton, Canada, assignor to Greif Bros. Corporation, Delaware, Ohio

Division of Ser. No. 468,951, Feb. 23, 1983,. This application Mar. 8, 1984, Ser. No. 587,612

Int. Cl.[3] B21D *51/00*

U.S. Cl. 413—4 **10 Claims**



1. A method of making a nestable drum comprising:

providing a cylindrical shell with one end having a first diameter;

flaring out a portion of said one end to form an edge;

providing a circular plate-shaped closure with a raised center, a disk, and a cylindrical side connecting said center to said disk, said side having a second diameter smaller than said first diameter and a plurality of ribs extending radially away from said center to form a circle having an outer diameter equal to said first diameter;

associating the shell with the closure so that the edge coincides with the disk and the center and the ribs are disposed within the shell; and

curling the edge and the disk together to form a seam.

4,512,701

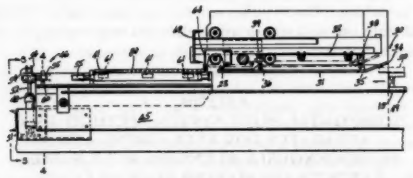
PALLET HEIGHT SENSING MECHANISM

Julian D. Foust; Leonard M. Ysidro, Sr., both of Cleveland, and Danny R. Cross, Decatur, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 22, 1982, Ser. No. 452,261

Int. Cl.[3] B65G *43/08*

U.S. Cl. 414—101 **17 Claims**



1. In a conveyor for moving pallets along a predetermined path of travel, comprising in combination:

(a) sensing means positioned along the predetermined path of travel to sense the height of individual pallets as each pallet travels along the predetermined path of travel;

(b) signal means cooperative with the sensing means and activated by a pallet being sensed by the sensing means;

(c) control means cooperative with the signal means to receive a signal from the signal means indicating the height of the individual pallet;

(d) product receiving means overlying the predetermined path of travel and moveable upwardly in at least a generally vertical direction to permit individual pallets to pass thereunder along the predetermined path of travel without any interference; and

(e) elevation means cooperative with and responsive to the control means to move the product receiving means in the generally vertical direction.

4,512,702

INSTALLATION FOR FEEDING A SHAFT FURNACE

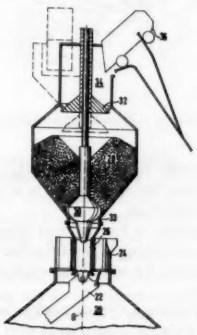
Pierre Mailliet, and Leon Ulveling, both of Howald, Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Mar. 10, 1983, Ser. No. 473,965

Claims priority, application Luxembourg, Mar. 10, 1982, 84000

Int. Cl.[3] C21B *7/20*

U.S. Cl. 414—202 **24 Claims**



1. A feeding device for a shaft furnace comprising:

a storage chamber having upper and lower ends;

a feed channel at the lower end of said storage chamber, said feed channel having a vertical axis and having upper and lower ends;

rotatable distribution means at the lower end of said feed channel;

dosing means at the lower end of said storage chamber, said dosing means being symmetrically mounted about said vertical axis, said dosing means being variable between a closed position in which it is in sealing engagement with seat means on said storage chamber to prevent flow of material from said storage chamber and said feed channel, and a plurality of adjustable open positions for controlling flow of material from said storage chamber to said feed channel;

said dosing means including a conical element converging downwardly toward said vertical feed channel, wherein said dosing means defining a variable annular discharge orifice as said dosing means moves between said closed and open positions to establish and vary a vertical flow of charging material along said vertical axis of said feed channel; and

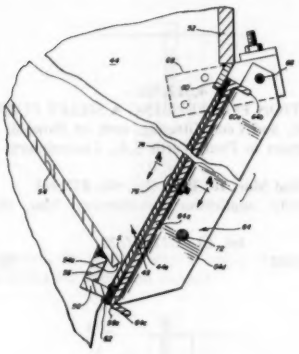
means for moving said dosing means between said closed and open positions.

4,512,703

BOTTOM SILO UNLOADER

James W. Lepley, Smithville, Ohio, assignor to Flying Dutchman, Inc., Smithville, Ohio

Filed Jul. 14, 1983, Ser. No. 513,714
Int. Cl.³ B65G 3/10
U.S. Cl. 414—288 14 Claims



1. A silo unloader for unloading silage contained in a silo through a discharge opening formed in a lower wall of the silo said unloader comprising:

a housing adapted to be mounted adjacent said discharge opening for receiving silage from the silo and including a discharge chute for said silage extending downwardly of said opening,

said chute including a sloping bottom wall terminating at a lower end forming a horizontal drip edge, and a pair of sidewalls extending upwardly along opposite sides of said sloping bottom wall, said sidewalls having free outer side edges spaced outwardly of said drip edge and sloping upwardly and outwardly away from said bottom wall and said horizontal drip edge, said free edge side edges defining opposite sides of a discharge outlet for silage and the like to be unloaded from said silo,

a discharge door mounted to pivot about a horizontal axis above said drip edge between open and closed positions with respect to said discharge outlet, said door having an inside surface spaced apart from said drip edge when said door is closed,

resilient sealing means adjacent edge portions of said door for sealing said discharge outlet when said door is closed, and

said chute including a lower sealing bar forming a lower edge of said discharge opening extending between said free outer side edges of said sidewalls, said sealing bar having a lower edge spaced below said drip edge and adapted to engage a lower edge portion of said sealing means when said discharge door is in said closed position,

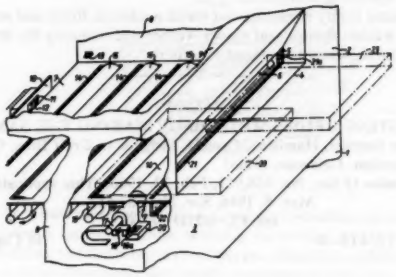
said drip edge being positioned in spaced apart relation inwardly of an inside face of said discharge door when said door is sealed in said closed position whereby any silage hanging over said drip edge does not prevent tight sealing along said lower edge of said discharge opening.

4,512,704

ARRANGEMENT FOR UNLOADING AND LOADING X-RAY FILM CASSETTES

Peter Hösel, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,162
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122581
Int. Cl.³ B65G 43/08
U.S. Cl. 414—292 10 Claims



1. In an arrangement for handling, especially unloading and loading, cassettes, particularly X-ray cassettes, a combination comprising means for defining a channel for receiving the respective cassette, having an inlet opening extending along a plane; means for transporting the respective cassette along said plane and through said inlet opening into and out of said channel, including a plurality of transporting elements situated in said channel and movable in two opposite transporting directions, and means for driving said transporting elements; means for light-tightly closing said inlet opening at least when the respective cassette is fully received in said channel; and means for controlling the operation of said driving means, including a switching member formed as a rotatable switching roller which is arranged immediately near said inlet opening parallel to said plane substantially over the entire width of said inlet opening as considered in said plane and mounted for movement between an extended position assumed when said channel is empty, and a retracted position assumed when a single cassette enters said channel or leaves said channel through said inlet opening, and means for switching said driving means between a deenergized and an energized state thereof in response to the movement of said switching roller from said extended to said retracted position thereof so that when a cassette enters said channel through said inlet opening said driving means is switched by said switching roller to the energized state to move said transporting elements in one transporting direction and to thereby transport the cassette into said channel, whereas after said driving means has been switched to move said transporting elements in the other opposite direction and to thereby transport the cassette out of said channel and after the cassette leaves said channel through said inlet opening said switching roller switches said driving means to the deenergized state and said transporting elements stop moving in the opposite direction.

4,512,705

HORIZONTAL PLOW SYSTEM METHOD AND APPARATUS FOR RECLAIMING AND HOMOGENOUSLY BLENDING BULK SOLID PARTICULATE MATTER SUCH AS COAL

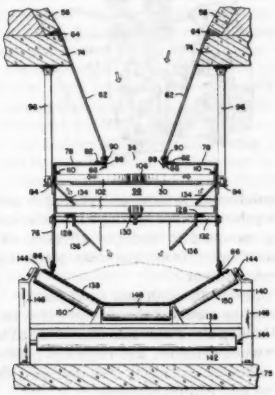
James L. Gutsch, 14909 W. 84th Ter., Lenexa, Kans. 66215

Filed May 17, 1983, Ser. No. 495,523
Int. Cl.³ B65G 65/38
U.S. Cl. 414—327 19 Claims

1. A horizontal plow system apparatus for the reclaiming

and homogenous blending of solid flowable particulate matter, such as coal, adapted to be positioned under a live storage facility having an opening at the bottom, and over a moving conveying means, comprising a displacement assembly, which in turn is comprised of:

(a) a receiving stationary top plate to be arranged in alignment with and beneath the opening of the live storage facility to receive the flow of coal which falls down onto the receiving stationary top plate via gravitational forces from the live storage facility; and



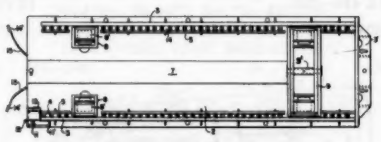
(b) a horizontal flight subassembly, supportively adapted for slidable travel on top of the receiving stationary top plate to continuously and simultaneously displace coal, which was previously deposited from the live storage facility from the sides of the receiving stationary top plate upon demand, during rotational end to end movement about said receiving stationary top plate, whereby the coal thereafter falls down onto the moving conveying means, to then be transported to the site of a downstream process at a plant facility.

4,512,706

SHEAR DOLLY FOR LONG WALL MINING

John P. Thompson, Canonsburg, Pa., assignor to Phillips Mine & Mill, Inc., Bridgeville, Pa.

Filed Mar. 18, 1983, Ser. No. 476,616
Int. Cl.³ E21C *29/02*
U.S. Cl. 414—373 **5 Claims**



1. For use in long wall mining operations, a dolly for moving a shear from place to place comprising:

a wheeled platform with a parallel rail extending along each side thereof defining a longitudinal axis between said parallel rails on which the shear may travel onto and off from the dolly out from and onto a pan-line in the mine, the wheeled platform adapted to travel along a path which is generally parallel to the longitudinal axis of said parallel rails carried thereon;

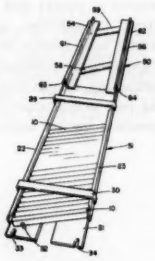
a rack bar ridgedly supported on and extending along at least one side of the platform and comprising one of said two parallel rails, one end of the rack bar on the wheeled platform being formed to provide an interfitting connection with a rack bar section at the end of the rack bar forming a part of the pan-line in the mine, said connection when the rack on the platform and the pan-line rack section are interfitted then forms a continuous toothed rack for engagement with a meshing drive gear on the shear, the other of the two rails on the platform also having an interfitting connection with a second rail of the pan-line.

4,512,707

SYSTEM FOR LOADING AND DISPENSING ARTICLES FROM A MAGAZINE

David R. Dines, Oklahoma City, and Vertis C. Webb, Shawnee, both of Okla., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 18, 1983, Ser. No. 495,561
Int. Cl.³ B65G *1/18*
U.S. Cl. 414—404 **8 Claims**



1. A system for dispensing bar-like articles, which comprises:

a parallelogram arrangement of pivotally connected frame members for initially supporting a supply of bar-like articles orthogonally with respect to a pair of opposed frame members when said frame members are in first positions, and for supporting the supply of bar-like articles at inclines to said opposed frame members when said frame members are pivoted to second positions;

a magazine having a pair of opposed rails spaced apart a distance equal to the spacing of said opposed frame members when said opposed frame members are in said second positions;

means for coupling the frame member arrangement in said second position to said opposed rails to enable the transfer of the bar-like articles from said frame member arrangement to said magazine; and

means secured to saidd magazine for supporting the bar-like articles between said rails in the inclined positions.

4,512,708

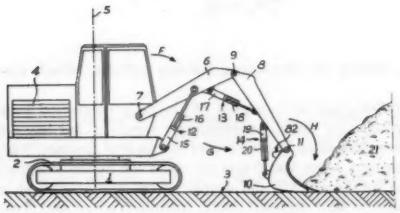
EARTH-MOVING MACHINE WITH BOOM, DIPPERSTICK AND BUCKET, EQUIPPED WITH MEANS FOR DIRECTIONALLY-ADJUSTING THE BUCKET

Claude P. Boichu, Nogent-sur-Oise, and Victor Yeou, Meaux, both of France, assignors to Poclain, Le Plesses-Belleville, France

Filed May 10, 1983, Ser. No. 494,433
Claims priority, application France, May 26, 1982, 82 09166
Int. Cl.³ E02F *3/42*
U.S. Cl. 414—694 **9 Claims**

1. An earth-moving machine of the loading type, having a frame, a boom mounted for pivoting with respect to said frame, a dipperstick mounted for pivoting with respect to said boom, a bucket for loading the material, mounted for pivoting with respect to the stick, a double-acting boom member controlling the relative pivoting movement of the boom with respect to the frame coupled between the boom and frame and compris-

ing two supply connections for respectively "raising" and "lowering" the boom, a double-acting stick member controlling the relative pivoting movement of the dipperstick with respect to the boom coupled between these two elements and comprising two supply connections for respectively "extending" and "retracting" the stick, a double-acting bucket member to adjust the relative pivoting movement of the bucket with respect to the dipperstick, coupled between these two elements and comprising two supply connections for respectively "filling" and "emptying" the bucket, at least one source of power, a three-position boom main control valve connected via three separate connections to a source of power and to the said boom "raising" and "lowering" connections, said boom main control valve connecting the said source of power, in its first position, with the boom raising connection, in its third position with the boom lowering connection, and in its second position, isolating said source of power from said connections, a three-position dipperstick main control valve connected by three separate connections with a source of power and with the stick- "extending" and "retracting" connections, said dipperstick main control valve connecting said source of power, in its first position, with the stick-extending connection, in its third position with the stick-retracting connection, and in its second position, isolating said two connections from said source of power, and a three-position bucket main control valve connected by three separate connections with a source of power and with the bucket "filling" and "emptying" connections, said bucket main control valve connecting said source of power, in its first position, with the bucket filling connection, in its third position, with the bucket emptying connection, and, in its second position, isolating said connections from said source of power, and said bucket main control valve being provided with a first means to adjust its position, said means being adapted to place said control valve in any one of its three positions be direct actuation by the machine operator, the bucket main control valve having second means to adjust its position adapted to place said bucket main control valve in its third position automatically from its second position, and being to this effect connected to a source of power by a control connection, an auxiliary control valve assembly with at least two positions being interposed on said control connection to ensure its continuity on either of its sides in its first position and break off said connection in its other positions, the auxiliary control valve assembly being placed in its first position solely when the boom and stick main control valves are in their third and first positions respectively and wherein in the first position of said auxiliary control valve assembly, the second means for adjusting the position of the bucket main control valve, effectively connected with the source of power, places said bucket main control valve in its third position.

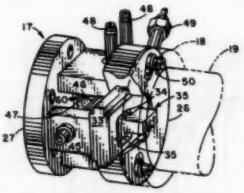


4,512,709

ROBOT TOOLCHANGER SYSTEM

Daniel M. Hennekes, Morrow, Ohio; Richard A. Kolde, Ft. Thomas, Ky., and David E. Suica, Lebanon, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 25, 1983, Ser. No. 516,972
Int. Cl.³ B66C *1/00*
U.S. Cl. 414—729 **4 Claims**



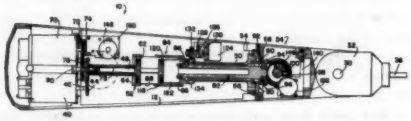
3. A robot toolchanger system, comprising in combination:
(a) a movable robot member having a movable end effector;
(b) a housing mounted to said end effector, said housing having spaced-apart front and rear plates rigidly connected to one another;
(c) a central opening through said front plate;
(d) a linear actuator mounted to said rear plate, between said plates, and having a rod movable transverse to said central opening between extended and retracted positions;
(e) a linear slideway extending through said front plate, transverse to said central opening;
(f) a linear slide carried in said slideway and affixed to said actuator rod and movable in accordance with said actuator movement between locking and unlocking positions, said slide further having an aperture alignable with said central opening and a ramp surface adjacent said aperture for engaging a tool retention member;
(g) a toolbase having a tool retention member affixed thereto said member insertable into said housing through said central opening and said slide aperture;
(h) means for positioning said toolbase on said housing; and
(i) means for positioning and securing said housing on said movable end effector.

4,512,710

ROBOT FOREARM

Carl R. Flatau, Middle Island, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Sep. 3, 1982, Ser. No. 413,634
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—735 **12 Claims**



1. Robot arm apparatus comprising a robot arm having a proximal end and a distal end, pivotal mounting means connected to the proximal end for pivoting the arm about the mounting means, axially rotatable means connected to a distal end of the forearm for axially turning with respect to a remainder of the forearm, angularly tiltable means connected to the axially rotatable means for tilting with respect to the axially rotatable means, first drive means connected to the forearm, a first drive shaft connected to the first drive means for turning by the first drive means, first drive gear means connected to the first drive shaft remote from the first drive means, first

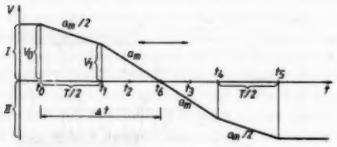
driven gear means surrounding the first drive gear means and meshing therewith and having a greater number of teeth than the first drive gear means whereby the first driven gear means rotates at an angular rate less than the angular rate of rotation of the first drive gear means, and a first driven shaft connected to the first driven gear means for rotating therewith, the axially rotatable means being connected to the driven shaft for being rotated thereby, second drive means connected to the forearm, a second drive shaft connected to the second drive means for turning by the second drive means, second drive gear means connected to the second drive shaft remote from the second drive means, second driven gear means surrounding the second drive gear means and meshing therewith and having a greater number of teeth than the second drive gear means whereby the second driven gear means rotates at an angular rate less than the angular rate of rotation of the second drive gear means, and a second driven shaft connected to the second drive gear means for rotating therewith, the angular tiltable means being drivingly interconnected to the second shaft for being actuated thereby, the first and second drive shafts being concentric, the first drive shaft being a hollow drive shaft and the second drive shaft being concentrically mounted within the first drive shaft and extending outward therefrom at opposite ends thereof.

6. Robot forearm drive apparatus for rotation of a distal forearm portion and for angular tilting of a wrist connected to the distal forearm portion comprising first and second drive means, first and second input shafts connected respectively to the first and second drive means, the first input shaft comprising a hollow outer shaft and the second input shaft comprising an inner shaft concentrically positioned within the outer shaft, first and second speed reducing drive means having respective first and second input gear means respectively connected to the first and second input shafts and having first and second output gear means surrounding the first and second input gear means in substantial circumferential contact therewith, the first and second output gear means having greater numbers of teeth than the first and second input gear means, first and second output shafts respectively connected to the first and second output gear means of the speed reducing drives, the first output shaft comprising a hollow outer output shaft and the second output shaft comprising an inner output shaft concentrically positioned within the outer output shaft, the distal forearm portion being connected to a distal end of the first output shaft for turning with the first output shaft, the wrist being pivoted to the distal forearm portion, and wrist tilt means connected between the second output shaft and the wrist for angularly tilting the wrist.

4,512,711
UNLOADING OF GOODS, SUCH AS BULK GOODS FROM A DRIVEN, SUSPENDED LOAD-CARRIER

Bernt Ling, Västerås, and Mikael Sternad, Upsala, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 20, 1982, Ser. No. 420,379
Claims priority, application Sweden, Sep. 21, 1981, 8105570
Int. Cl.³ B66C *19/00*; B65G *65/00*
U.S. Cl. 414—786 **7 Claims**

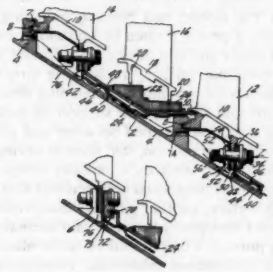


1. A method for controlling the lateral displacement of a trolley supporting goods to be unloaded, the goods being releasably attached to the trolley via an elongated flexible member and released from said flexible member at an unloading location during deceleration of the trolley, comprising moving the trolley laterally in one direction towards the unloading location with the flexible member extending vertically, decelerating the trolley to rest in a first and second deceleration steps, the first deceleration step having approximately half the deceleration of the second step, the flexible member having an angular velocity of about zero and a certain angle of deflection from vertical after said second deceleration step, releasing said goods from said flexible member during said second deceleration step, immediately accelerating the trolley in the opposite direction in first and second acceleration steps, the first acceleration step having approximately twice the acceleration of the second acceleration step, the flexible member being approximately vertical with approximately zero angular velocity after said second acceleration step.

4,512,712
TURBINE STATOR ASSEMBLY

Walter J. Baran, Jr., South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1983, Ser. No. 518,907
Int. Cl.³ F01D *25/08*
U.S. Cl. 415—116 **12 Claims**



1. A turbine stator construction including:

an annular turbine case having axially spaced pairs of inwardly extending circumferential flanges on its inner surfaces, each pair consisting of an upstream flange and a downstream flange spaced therefrom;

spaced rows of turbine vanes positioned within the case, each vane having an outer shroud and each shroud having a forwardly extending rib, a forwardly projecting lug spaced outwardly from the rib and an outwardly projecting flange;

the upstream flange having a groove in its downstream surface to receive the forwardly projecting lugs on the shrouds to hold them in radial position and the downstream flange having a notch engaging the outwardly projecting flanges on the shrouds;

a row of bolts extending through the dowstream flange and the outwardly projecting flanges to hold the shrouds and vanes in position;

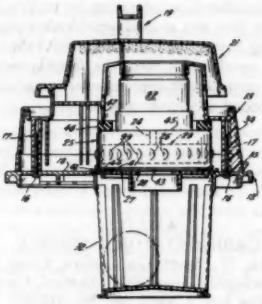
a ring of air seal segments extending between the rows of vanes at their outer shrouds, and

a row of clips held in position on the downstream side of the downstream flange by said bolts, said clips engaging the upstream edges of the segments and positioning the segments, the lower edges of the segments being engaged by the forwardly extending ribs on the shrouds, said ribs urging the segments outwardly to clamp the segments between the upstream flange surrounding the segments and said ribs.

4,512,713
VIBRATION ISOLATING MEANS

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Sep. 17, 1982, Ser. No. 419,213
Int. Cl.³ A47L 9/22
U.S. Cl. 415—119 1 Claim

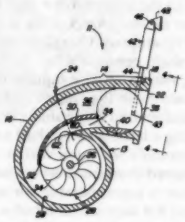


1. In a tank type vacuum cleaner having a motor and impeller housing connectable to the tank of said vacuum cleaner, said housing having a torque-resistant and vibration-reduced mounting for the motor; said housing including an electric motor structure, a device rotated by said motor and a support to which said motor and said device are mounted, said housing including a mounting surface, a clamping structure in said housing and means for moving said clamping structure of said housing toward said surface, said support of said motor and device having a section clamped between said mounting surface and said clamping portion, said section having oppositely facing first and second surfaces, a partially compressed vibration absorbing means interposed between said first surface and said mounting surface, another partially compressed vibration absorbing means interposed between said second surface and said clamping portion, a first of said vibration absorbing means including first and second rubber-like elements in frictional face-to-face engagement; each of the first and second rubber-like elements constituting a relatively thin flat ring-like member; and a second of said vibration-absorbing means including a third rubber-like element of a thickness at least as great as the combined thicknesses of said first and second rubber-like elements, with said thicknesses being measured in a direction perpendicular to the faces of said rubber-like elements; the mounting surface and the clamping portion constituting respective first and second clamp sections, said first rubber-like element being cemented to one of the surfaces of said support and said second rubber-like element being cemented to one of said clamp sections; the other of said vibration-absorbing means includes a third rubber-like element cemented to the other surface of said support; the motor, the device and the support are portions of a sub-assembly and frictional forces at the interface between said first and second rubber-like elements are sufficient to resist starting torque generated by said motor; the said housing including an annular partition surrounding said motor, said partition having a free edge constituting said clamping portion in compressing engagement with said third rubber-like element, a second of said vibration-absorbing means including a third rubber-like element, said housing including an annular partition surrounding said motor, said partition having a free edge constituting said clamping portion in compressing engagement with said third rubber-like element; the device comprises a fan impeller and the support comprises a casing for said impeller, said first and second surfaces partially defining said casing and being on the outside thereof, said second surface being above said first surface, said first and third rubber-like elements being cemented to the respective first and second surfaces, said second rubber-like element being cemented to said mounting surface and being positioned below said first rubber-like cement.

4,512,714
VARIABLE FLOW TURBINE

Merle L. Kaesser, Waverly, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 349,283, Feb. 16, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,004
Int. Cl.³ F01D 17/14, 17/18
U.S. Cl. 415—151 19 Claims



15. An improved variable flow turbine comprising:

(a) a housing including a curved section with an inlet at one end and joined at a second end to a volute section which is formed about an axis, said volute section having an outlet coaxially aligned with the axis, and said curved section being curved in the direction of said volute;

(b) a rotor positioned within said housing for rotation about the axis of said volute section, said rotor having a plurality of circumferentially spaced blades;

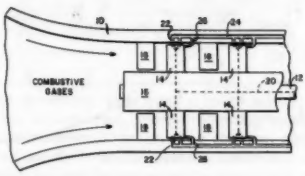
(c) a valve positioned at said inlet and within said curved section for controlling flow therethrough such that as said valve is moved towards a closed position, both the mass average radius of curvature and the velocity of the incoming exhaust gas are increased; and

(d) a divider wall formed in said housing and extending from said valve inwardly through said curved section and into said volute section for dividing said housing into inner and outer radial passages, each passage having a cross-sectional area within said volute section which is constantly decreasing as said passage approaches said rotor.

4,512,715
METHOD AND MEANS FOR RECAPTURING COOLANT IN A GAS TURBINE

Arthur Cohn, Palo Alto, and Robert B. Schainker, Woodside, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 171,131, Jul. 22, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,162
Int. Cl.³ F02C 7/12
U.S. Cl. 415—168 5 Claims



1. A gas turbine comprising a rotary shaft, a plurality of blades mounted on said shaft, a casing surrounding said blades and shaft for confining and directing the flow of a motive fluid past said blades, means for transmitting a liquid coolant

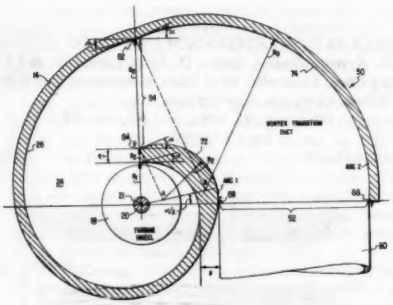
through said blades and ejecting said liquid from the ends of said blades, liquid receptive ports in said casing in radial alignment with said blades whereby liquid ejected radially from said blades is captured by said ports, and trough-means in said casing axially displaced from said blades and protruding from said casing so to be positioned to capture liquid coolant entrained in the blow-by gases that flow between the blade tips and the casing wall, said trough means including an annular wall extending inwardly from said casing in general radial alignment with the tips of said blades whereby capture of ejected liquid is facilitated.

4,512,716

VORTEX TRANSITION DUCT

M. Louise McHenry, Indianapolis, and Robert C. Bremer, Jr., Brownsburg, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,245
Int. Cl.³ F01D *1/08, 25/24*
U.S. Cl. 415—205 **18 Claims**



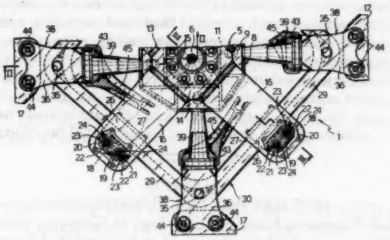
1. A radial inflow turbine construction, the turbine adapted to be employed with a compressor in a turbocharger for supercharging an internal combustion, reciprocating piston engine, the turbine including a radial inflow turbine wheel, a generally annular turbine volute housing having an inlet entrance opening for receiving exhaust gases from an internal combustion engine, the turbine wheel mounted for rotation within the housing, the volute housing interior defining an arcuate nozzle for discharging exhaust gas fed from an internal combustion engine into the housing inlet to the turbine wheel, the radially outermost surface of the arcuate nozzle being in the form of a spiral, so that the radially outermost surface of the nozzle becomes progressively nearer in passing into the turbine volute using, to the periphery of the turbine wheel, engine exhaust gases adapted to pass from the turbine housing inlet through the arcuate nozzle and radially inwardly of the turbine wheel to cause the turbine wheel to rotate, means coupled between the exhaust gas supply of an internal combustion engine and the exhaust gas inlet of the turbine volute housing for imparting a free vortex distribution of velocities to the exhaust gas as it enters the turbine volute housing, said means for imparting a free vortex velocity distribution being a vortex transition duct mounted with its exit end feeding engine exhaust gas into the inlet of the turbine housing, the transition duct having a radially innermost and a radially outermost wall, at least one of said walls varying in width along the length of the duct, whereby lower gas losses and improved gas turbine efficiency are both realized as compared to a distribution of velocities at the turbine housing inlet which is other than a free vortex distribution.

4,512,717

HELICOPTER ROTOR

Santino Pancotti, Gallarate, and Renato Mariani, Samarate, both of Italy, assignors to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed Mar. 12, 1984, Ser. No. 588,453
Claims priority, application Italy, Mar. 15, 1983, 67285 A/83
Int. Cl.³ B64C *11/06, 27/38*
U.S. Cl. 416—134 A **5 Claims**



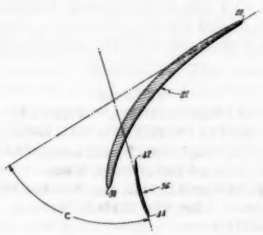
1. Helicopter rotor comprising a center hub (5), designed to fit on to a center drive shaft (2), a number of blades (17) extending outwards from the said hub (5), each said blade (17) being connected to the said hub (5) by connecting means designed to enable the blade (17) to oscillate in the plane parallel to the said drive shaft (2), in the plane perpendicular to the said drive shaft (2), as well as around its own axis; the said connecting means comprising, for each blade (17), a fork (38) extending outwards essentially radially from the said hub (5) and connected to it by first elastomer supporting means (46); the said fork (38) having two arms (36, 37) facing outwards and connected to the connecting end of the relative blade (17); characterised by the fact that the said connecting means also comprise an annular component (30) extending round the said hub (5) and through the said forks (38) and connected to each of the latter by second elastomer supporting means (57); the said hub (5) comprising an essentially star-shaped plate (13) with a number of radial arms (16) and connecting means (21) being mounted between each said arm (16) and a respective point on the said annular component (30) lying halfway between two adjacent said second elastomer supporting means (57).

4,512,718

TANDEM FAN STAGE FOR GAS TURBINE ENGINES

Hans Stargardter, Bloomfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 14, 1982, Ser. No. 434,215
Int. Cl.³ F04D *29/38*
U.S. Cl. 416—231 B **5 Claims**



1. A fan assembly for a turbofan gas turbine engine, wherein the fan assembly includes:

a fan disk;

a case circumscribing the fan disk and spaced apart there-

from to form a flowpath for working medium gases between the disk and the case;

a plurality of principal fan blades extending outwardly from the fan disk and across the flowpath for working medium gases into proximity with the circumscribing case, each blade having a camber angle which is sufficiently low such that the fundamental natural frequency of the blade in bending is less than the 2E multiple of engine rotor speed between flight idle and maximum power conditions for the turbofan engine in which the blade is installed;

a plurality of secondary fan blades at least one each corresponding to each principal blade and extending outwardly from the rotor disk near the trailing edge of the corresponding fan blade only partially across the flowpath for working medium gases wherein each principal fan blade and corresponding secondary fan blades form in composite the aerodynamic equivalent of a single blade having a camber greater than that of the principal fan blade.

4,512,719

HOT GAS WETTED TURBINE BLADE

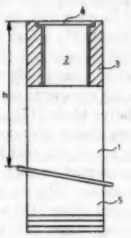
Axel Rossmann, Karlsfeld, Fed. Rep. of Germany, assignor to Motoren-un Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,344

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129304

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—241 B **5 Claims**



1. A turbine blade adapted for use with hot gases comprising a radially inward portion constituted of metal, a metal core projecting radially from said inward portion, and a ceramic portion of airfoil section supported on said core and totally enclosing the same to form the entire airfoil section of the blade radially outwards of said metal inward portion, said ceramic portion extending radially less than one-half of the total span of the blade, said ceramic portion having a radially inward end of airfoil section adjacent said metal inward portion, said metal inward portion having an airfoil section which is continuous with that of said ceramic portion whereby the airfoil section of said blade is collectively composed by the metal inward portion and the outer ceramic portion.

4,512,720

PUMP IMPELLERS AND MANUFACTURE THEREOF BY CO-INJECTION MOLDING

Peter N. Cholakis, Hopkinton, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Apr. 12, 1983, Ser. No. 484,202

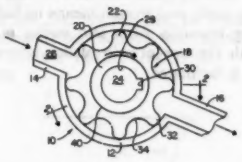
Int. Cl.³ F01D *5/14*

U.S. Cl. 416—241 A **7 Claims**

1. A pump impeller comprising:

a core section of a rigid thermoplastic polymeric material and

a vane section surrounding and secured to said core section, said vane section comprising a plurality of vanes and being made of a thermoplastic elastomeric material characterized in that said vane section is secured to said core section by direct bonding said rigid thermoplastic polymeric material to said thermoplastic elastomeric material through the fusion of a thin interfacial zone of said elastomeric and polymeric materials formed as a result of coinjection molding and wherein said thin interfacial zone has



a thickness on the order of 1×10^{-6} inch (2.5×10^{-6} cm), said core section being made of material having a flexural modulus in excess of 400,000 psi (28,000 kg cm^{-2}), and said vane section being made of a soft low modulus material having a Shore A scale durometer value between about 35 and about 85.

4,512,721

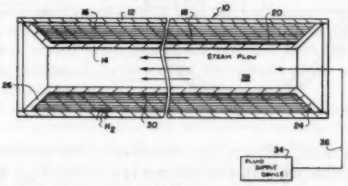
VACUUM INSULATED STEM INJECTION TUBING

Paul S. Ayres, Alliance; Burton D. Ziels, Lancaster, and Chou-Ming Chen, Louisville, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 31, 1982, Ser. No. 413,285

Int. Cl.³ F04B *37/02*

U.S. Cl. 417—51 **6 Claims**



1. Apparatus for the delivery of hot fluids to a well comprising:

an inner tubular having an outer surface and defining an inner space adapted for conveying fluids at a temperature within the range of about 400 to 700 degrees F.;

means for supplying fluid to said inner tubular within said temperature range which fluid supply means is connected to said inner tubular;

an outer tubular disposed around said inner tubular and defining an annular space therewith;

said inner and outer tubulars are composed of steel, exclusive of corrosion resistant coatings;

insulation disposed in said annular space;

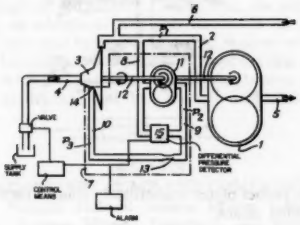
means for connecting said inner and outer tubulars so that said annular space is closed to atmospheric pressure and a vacuum may be established in said closed annular space; and

a getter material for absorbing at least one active gas in said closed annular space, said getter material is activatable at a temperature within said temperature range, said getter material is disposed in said closed annular space between said insulation and said outer surface of said inner tubular and adjacent said outer surface of said inner tubular, and said getter material includes at least one of the group consisting of titanium, an alloy of titanium, zirconium, and an alloy of zirconium.

4,512,722
DEVICE AND PROCESS FOR MONITORING CAVITATION IN A POSITIVE DISPLACEMENT PUMP

Pierre C. Mouton, Grigny, France, assignor to Societe Nationale d'Etude de Constudies de Mateurs d'Aviation, France

Filed Oct. 18, 1983, Ser. No. 543,067
Claims priority, application France, Oct. 28, 1982, 82 18053
Int. Cl.³ F04B 21/00
U.S. Cl. 417—63 14 Claims



1. A device for monitoring cavitation parameters of a positive displacement pump in a fluid system comprising:

(a) supply means to apply fluid to the positive displacement pump via a feeder line at a first pressure (P_1);

(b) a venturi;

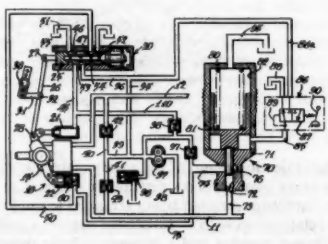
(c) flow generating means for generating a flow of fluid proportional to the flow of the positive displacement pump, the flow generating means having an inlet connected to the feeder line and an outlet connected to the venturi inlet to supply fluid thereto at a second pressure (P_2), the capacity of the flow generating means the throat cross-section of the venturi being such that cavitation occurs in the venturi throat prior to cavitation occurring in the positive displacement pump; and,

(d) detecting means to detect the difference between the first (P_1) and second (P_2) pressures and to generate a signal when the difference between P_1 and P_2 reaches or exceeds a predetermined limit.

4,512,723
PRESSURE LIMITER

Keith R. Williams, Nevada, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 17, 1983, Ser. No. 542,493
Int. Cl.³ F04B 49/00
U.S. Cl. 417—222 3 Claims

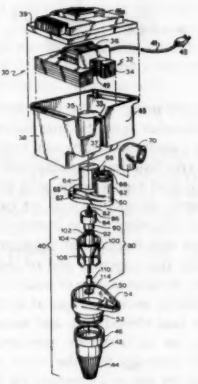


1. A remotely variable pressure limiter for a variable displacement pump having an adjustable swashplate and constructed to have pressure moments urging tha swashplate in a pump destroking direction, comprising, a pair of servo cylinders connected to said swashplate with one servo cylinder including a spring acting to urge the swashplate in the pump destroking direction, a displacement control valve having a pair of connections one to each of said servo cylinders, one of said connections providing connection of said one servo cylinder to a reduced case pressure through an orifice and the other connection providing for delivery of a displacement-setting pressure to the other of said servo cylinders, a pressure limiter valve for selectively connecting pump discharge pressure to said one servo cylinder to move the swashplate in a displacement reducing direction and having a movable valve member which moves from a first position to make said connection and which is urged away from said first position by pump discharge pressure, means for remotely setting the value of the discharge pressure which will move the valve member including a spring acting on the valve member, and a piston engaging said spring and acted upon by a remotely set control pressure to vary the force required to move the valve member, and a check valve communicating with said other servo cylinder to permit rapid discharge of fluid when pump discharge pressure is directed to said one servo cylinder.

4,512,724
ELECTRIC PUMP FOR USE IN FILTERING SYSTEM OF A TROPICAL FISH TANK OR THE LIKE

Tibor Horvath, Brooklyn, N.Y., assignor to Metaframe, Inc., Irvington, N.J.

Filed Mar. 17, 1983, Ser. No. 476,201
Int. Cl.³ F04B 9/00, 39/06, 35/04
U.S. Cl. 417—319 15 Claims



1. A pumping device comprising:

a stator unit including a first housing having a side wall and a socket defining open bottom cylindrical first shell and a rotor stator located in said first housing and extending about said first shell and a connecting portion extending between said socket and said side wall;

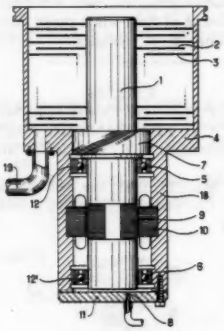
a rotor-impeller unit including a second housing having a plug defining bottom cylindrical second shell and a rotor-impeller assembly including an upper motor rotor registering with said second shell and exposed to the magnetic field of said stator and a pump impeller coaxial and rotatable with said rotor and disposed in said second housing below said rotor, said second housing having inlet and outlet ports in axial and peripheral communication respectively with said impeller, said first and second housing being separably coupled with said socket and plug in separable axial mutual engagement, said second housing including a chamber transversely offset from and extending to the level of said rotor and communicating with said impeller and said outlet port being formed in the upper part of said chamber and said housing including a channel extending radially from said plug shell to said chamber and being complimentary to and received by said connecting portion; and

means releasably locking said first and second housings in said separably coupled condition.

4,512,725
ROTARY VACUUM PUMP

Claude Saulgeot, Veyrier-du-Lac, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Feb. 16, 1983, Ser. No. 467,045
Claims priority, application France, Feb. 16, 1982, 82 02496
Int. Cl.³ F04B *17/00, 39/06;* H02K *9/00*
U.S. Cl. 417—366 **6 Claims**



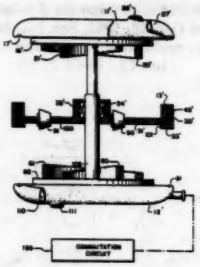
1. A hard vacuum pump of the type having a pump body forming a pump chamber, a multi-stage stator and a multi-stage rotor mounted on a shaft carried by said body, a motor driving said shaft, at least two ball bearings disposed in a sleeve formed by an extension of said pump body, said bearings supporting said shaft, a dynamic molecular seal set on said shaft at the pump body end of the sleeve, the improvement wherein the dynamic molecular seal is disposed between the bearings and the pump chamber, the opposite end of the sleeve from said body end is closed, an inlet nozzle of small diameter communicating with an outside source of gas at atmospheric pressure being provided at said closed end, and means for connecting said pump body to an exterior primary vacuum pump; whereby said ball bearings and the rotor of said motor are permanently swept by gas at a pressure on the order of a few tens of Torrs entering via said nozzle and leaving via said dynamic seal, thereby reducing the axial load borne by the bearings.

4,512,726
PUMP ADAPTABLE FOR USE AS AN ARTIFICIAL HEART

Walter E. Strimling, 63 Westcliff Rd., Weston, Mass. 02193

Filed Feb. 9, 1982, Ser. No. 347,184
Int. Cl.³ F04B *43/04;* A61F *1/00;* A61M *1/03*
U.S. Cl. 417—412 **9 Claims**

1. A pump arrangement comprising first and second pump chambers each having entrance and exit conduits, first and second means for separating said chambers and for defining an intermediate chamber therebetween, means for moving said first and second means along an axis in a manner to change the volume of said first and second pump chambers alternately, wherein said means for moving includes drive means and means proximally contactable against the first and second means for pushing said first and second means housed in said intermediate chamber, wherein the contactable means includes a pair of opposing pusher plates, each plate associated with a respective one of the first and second means, the plates having cam surfaces thereon and connected by a variable length guide means and wherein the drive means includes a rotary electric motor mounted on the guide means and having a rotor carrying rollers for actuating the cams for effecting pumping by

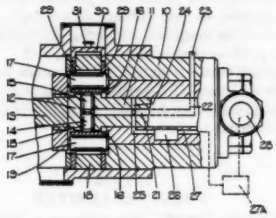


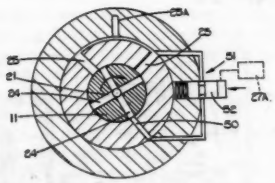
causing the pusher plates to alternately contact their respective first or second means.

4,512,727
FUEL INJECTION PUMP OF THE ROTARY DISTRIBUTOR TYPE

William R. Burborough, Gillingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Nov. 18, 1983, Ser. No. 553,131
Claims priority, application United Kingdom, Dec. 21, 1982, 8236276
Int. Cl.³ F04B *19/02;* F02M *39/00;* F02N *17/00*
U.S. Cl. 417—462 **3 Claims**





1. A fuel injection pump of the rotary distributor type comprising a body part, a rotary distributor member in the body part, the distributor member being arranged in use to be driven in timed relationship with an associated engine, a radial bore in the distributor member and a plunger slidable therein, a cam follower at the outer end of the plunger, an annular cam ring mounted in the body, said cam ring having a cam lobe on its internal peripheral surface whereby as the distributor member rotates inward movement will be imparted to the plunger, a delivery passage in the distributor member communicating with said bore and a plurality of outlet ports in the body, said delivery passage being positioned to register with said outlet ports to receive fuel displaced from the bore by the inward movement of the plunger, a plurality of inlet passages in the

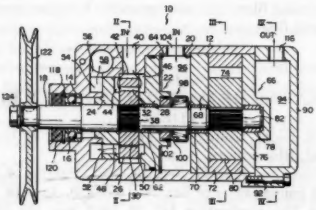
distributor member, said inlet passages communicating with said bore, an inlet port in the body, said inlet port communicating with an inlet passage to allow fuel flow to said bore during the time the plunger is permitted to move outwardly by the cam lobe, a low pressure pump for supplying fuel to said inlet port, throttle means for controlling the quantity of fuel supplied to said bore, a stop plate mounted in the body, said stop plate defining a stop surface engageable by the cam follower to control the maximum allowed outward movement of the plunger, said stop surface having a radial dimension which varies throughout the length of the surface, the pump further comprising an additional inlet port formed in the body, said additional inlet port being positioned to register with an inlet passage at least after the communication of the first mentioned inlet port with an inlet passage has been broken and valve means for controlling fuel flow through said additional inlet port.

4,512,728

COMBINED ROTARY PUMP AND COMPRESSOR UNIT

Hiromichi Nakano; Hideaki Sasaya; Mitsuo Inagaki, all of Okazaki; Kazuma Matsui, Toyohashi, and Kunimasa Yoshimura, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio; Nippondenso Co., Inc., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, all of, Japan

Filed Feb. 1, 1984, Ser. No. 575,999
Claims priority, application Japan, Feb. 8, 1983, 58-19944
Int. Cl.³ F01C *11/00, 19/00*
U.S. Cl. 418—3 **10 Claims**



1. A combined integrated rotary pump and compressor unit comprising:

an outer shell having a stepped bore therethrough extending from a front end to a rear end thereof, said stepped bore including a front eccentric small bore portion having a center line offset from the center line of said outer shell, the remaining portion of said stepped bore being substantially concentric to the center line of the shell;

a vane-type rotary pump assembly housed within said outer shell in the front part of said remaining concentric bore portion, said pump assembly including a pump front plate, a pump rear plate, a pump cylinder sandwiched between said pump front and rear plates to define a pumping chamber therebetween, and vaned pump rotor rotatably received in said pumping chamber and having a rotational axis aligned with the center line of said front eccentric bore portion;

a vane-type rotary compressor assembly received within said outer shell in the rear part of said concentric bore portion, said compressor assembly including a compressor front plate, a compressor rear plate, a compressor cylinder sandwiched between said compressor front and rear plates to define a compression chamber therebetween, and a vaned compressor rotor rotatably received in said compression chamber and having a rotational axis aligned with the center line of said front eccentric bore portion;

said compressor front plate being spaced from said pump rear plate to define therebetween within said outer shell a low pressure intake chamber for said compressor assembly, said intake chamber also serving as a seal chamber;

each of said pump front plate, pump rotor, pump rear plate, compressor front plate, and compressor rotor having a through bore longitudinally aligned with each other and centered on the center line of said front eccentric bore portion of the outer shell, said compressor rear plate having a forwardly open blind bore centered on the center line of said front eccentric bore portion;

a shaft journaled in said front eccentric bore portion in said outer shell and in said blind bore in said compressor rear plate and extending through said through bores to be drivingly coupled with said pump rotor and compressor rotor, said shaft having a forward end projecting forward through said front bore portion;

a drive pulley fastened to said forward end of the shaft;

a mechanical shaft seal assembly mounted in said seal chamber around said shaft to prevent leakage along the shaft;

an end cover secured spaced from said compressor rear plate to the rear end of said outer shell to define a high pressure delivery chamber also serving as an oil sump;

inlet means for introducing a working fluid into the suction zone of said pumping chamber;

outlet means for conducting the pump output from the high pressure zone of said pumping chamber;

inlet means for introducing a gaseous fluid into said low pressure intake chamber;

a passageway in said compressor assembly for communicating said low pressure intake chamber with the suction zone of the compression chamber;

a passageway in said compressor assembly for communicating the high pressure zone of the compression chamber with said high pressure delivery chamber; and

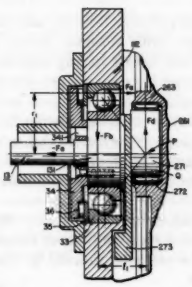
outlet means for transmitting the compressor output from the high pressure delivery chamber.

4,512,729

DRIVE BEARING DEVICE FOR A FLUID DISPLACEMENT APPARATUS

Seiichi Sakamoto, Gunma, and Kiyoshi Terauchi, Isesaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Oct. 12, 1982, Ser. No. 433,796
Claims priority, application Japan, Oct. 12, 1981, 56-162214
Int. Cl.³ F01C *1/02, 21/02;* **F16C** *19/16, 19/49*
U.S. Cl. 418—55 **6 Claims**



1. In a fluid displacement apparatus including a housing having a front end plate, a fixed fluid displacement member fixedly disposed relative to said housing, an orbiting fluid displacement member disposed within said housing and interfitting with said fixed fluid displacement member to make a plurality of line contacts to define sealed off fluid pockets, and a driving shaft which protrudes through said front end plate and is rotatably supported by said front end plate through a bearing, said drive shaft being connected to said orbiting fluid displacement member to effect orbital motion of said orbiting fluid displacement member, the improvement comprising:

an angular bearing which rotatably supports said drive shaft,

the pressure cone apex of said angular bearing coinciding in the axial direction with the driving point of said orbiting fluid displacement member;

a thrust race disposed on one axial end surface of said angular bearing;

a ring plate disposed within said front end plate, said ring plate facing said thrust race at a predetermined axial distance; and

a thrust bearing placed between said thrust race and said ring plate to carry the thrust force from said angular bearing.

4,512,730

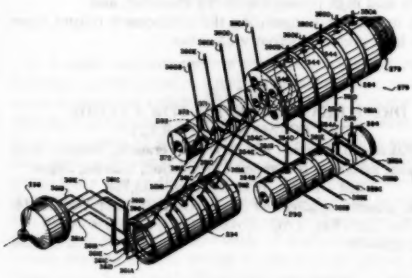
POLYMER FLOW STREAM REDIRECTING AND FEEDING DEVICE

Frederick G. Kudert, Niles; William A. Tennant, Schaumburg, and Thomas T. Tung, Hoffman Estates all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 13, 1983, Ser. No. 484,501

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—130 **23 Claims**



1. An elongated polymer flow stream redirecting and feeding device for use with a runner block and with a multi-polymer co-injection nozzle having separate entrance ports in the rear of the nozzle for the polymer streams, in a multi-coinjection nozzle, multi-polymer injection molding machine, for receiving a plurality of separate polymer flow streams directed from the runner block at the device and, while maintaining the flow streams separate, redirecting them to flow axially out of the forward end of the device into the multi-polymer co-injection nozzle, which comprises:

a plurality of inlets cut radially into the periphery of the device, each for receiving one of the plurality of separate polymer flow streams directed at the device from the runner block,

a plurality of feed channels, each in communication with an inlet and having an inward portion cut toward the central axis of the device and an axial portion in communication with the inwardly cut portion and running axially forward through the device,

a forward end portion having a forward end, and

a plurality of exit holes in the forward end portion, each in communication with the axial portion of a feed channel, the plurality of exit holes being arranged in a spaced pattern for feeding the separate polymer flow streams therethrough in spaced relation into the separate rear entrance ports of the multi-polymer co-injection nozzle of the multi-polymer injection molding machine.

4,512,731

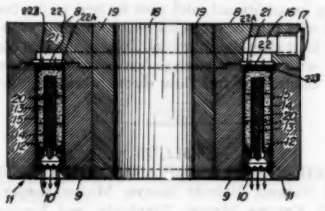
APPARATUS AND PROCESS FOR FILTERING MOLTEN POLYMER

Arnold J. Cobb, Florence, S.C., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 281,739, Jul. 9, 1981, Pat. No. 4,405,548. This application Sep. 12, 1983, Ser. No. 531,371

Int. Cl.³ D01D *1/10*

U.S. Cl. 425—198 **4 Claims**



1. An improved filter for polymer fed from a pressurized source, including a filter body and a bed of permeable ceramic material therein, said bed comprising sintered bauxite particles containing a minimum of 5.6% by weight of Fe_2O_3, said bauxite particles having a roundness of at least 0.8, as determined by the Krumbein and Sloss Chart of 1955, and an API standard mesh size of at least 12, said filter further comprising a spinneret for forming filaments, said spinneret being located downstream of said filter.

4,512,732

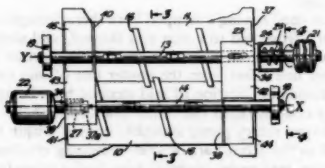
HEAT TREATING OF MATERIAL IN FINELY DIVIDED FORM

Friedhelm R. Feder, Collierville, Tenn., assignor to Wedco Incorporated, Bloomsbury, N.J.

Division of Ser. No. 416,747, Sep. 10, 1982, Pat. No. 4,421,703, which is a continuation of Ser. No. 139,630, Apr. 14, 1980, abandoned. This application Jul. 20, 1983, Ser. No. 503,467

Int. Cl.³ B29B *1/03*

U.S. Cl. 425—222 **15 Claims**



1. An apparatus suitable for the heat treatment of material comprising

at least two intersecting, axially disposed, generally cylindrical drums,

a rotatably mounted rotor disposed in each drum, said rotor having radially projecting, axially spaced blades disposed over a length of each drum, at least some of the blades of the rotors axially overlapping,

an inlet opening in at least one of the drums for introduction of the material into one end portion of the apparatus,

a first outlet opening in at least one of the drums for withdrawal of the material from the other end portion of the apparatus, the first outlet opening being disposed at the circumferential periphery of the drum,

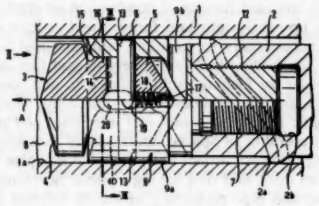
an end wall disposed at the end from which the material is withdrawn, and

a second outlet opening disposed in said end wall radially inwardly of the circumferential periphery of the drum.

4,512,733
ADJUSTABLE INJECTION MOLDING BACKFLOW PREVENTER

Martin Eichlseder, Tettenweis, and Erwin Bürkle, Benediktbeuern, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 19, 1983, Ser. No. 459,249
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203724
Int. Cl.³ B29F *3/02*
U.S. Cl. 425—207 **10 Claims**



1. In an injection molding plastifying assembly in combination:

means defining a plastifying cylinder;

a plastifying worm received in a bore of said cylinder and having an end past which molten synthetic resin is displaced; and

a backflow preventer mounted on said end of said worm, said backflow preventer comprising:

a housing member affixed to said worm, said housing member being formed with at least one passage adapted to be traversed by the molten synthetic resin,

a valve member having a generally conical forward face received with direct all around clearance in said bore forwardly of said housing member and having a shank of a smaller diameter than said face slidably inserted into said housing member such that said valve member is axially shiftable slidably relative to said housing member between an open position permitting said molten synthetic resin to flow past said valve member and a closed position blocking the flow of molten synthetic resin past said valve member, axial displacement between said positions defining a stroke of said valve member, one of said members being provided with two circular cross section radial bores and the other of said members being provided with an opening elongated in the direction of said stroke, and

a pin accessible from the periphery of said housing member and selectively passing through one of said bores and said opening for limiting said stroke at least in one direction, said one of said members being provided with said radial bores in angularly offset relation to one another and such that one of said radial bores is offset from the other of said radial bores in said direction, said pin being selectively insertable into said radial bores for setting the stroke of said backflow preventer.

4,512,734
ARRANGEMENT FOR EXTERNALLY AFFIXING OR PLACING BANDEROLES OR STRIPS ON RECEPTACLES

Jean-Marc Dronet, and Jacques Resseguier, both of Falaise, France, assignors to Ste d'Application Platique Mecanique et Electronicque Plastimechanique S.A., Falaise, France

Filed May 19, 1981, Ser. No. 265,080
Claims priority, application France, May 19, 1980, 80 11089
Int. Cl.³ B29C *17/00*
U.S. Cl. 425—305.1 **7 Claims**

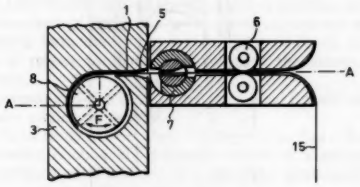
1. In a heat-forming machine for making receptacles from thermoplastic material, an improved arrangement for introducing cut banderoles or strips **1** into molds **2**, via a member **3** having at least one guide passage, the improvement comprising:

band feeding means for feeding a band **15** through a lateral slit **5** in said member **3**, said band feeding means include a pair of rollers **6**,

transverse cutting means **7** operatively connected to said pair of rollers **6** for cutting said band **15** into banderoles **1** of predetermined length;

longitudinal cutting means **18**, **19** operatively connected to said transverse cutting means **7**, said operative connection between the transverse and longitudinal cutting means being rigorously precisely maintained by means of a pair of gear wheels **17** which synchronously engage each other and by selecting the diameter of the wheels **6** to be such that their circumference is exactly equal to the length of the banderole **1**;

said pair of feed rollers **6** being coaxially mounted on a pair of parallel feed shafts **20**, **21**, at least one of said feed shafts



coaxially supports thereon the cutting wheel **18** of the cutting means **18**, **19** for longitudinally cutting said band **15** and at least one of said feed shafts is operatively connected to the device of said transverse cutting means **7**; the cutting edge of the cutting wheel **18** being disposed on a cylindrical surface of said cutting wheel **18** which is of the same diameter as the diameter of the wheels **6**; said cutting edge coacts with a cylindrical surface **19** of an other wheel which is coaxially mounted on the other feed shaft, which cylindrical surface is of the same diameter as said cutting wheel **18**;

the shafts **20**, **21** supporting the wheels **6**, the cutting wheel **18** and the cylinder **19**, on the one hand, and on the other hand, the drive **21** for the transverse cutting means **7** being selectively fixed at a predetermined angular relationship so that the transverse cutting means **7** are cutting only when the feed shaft **20** is in a predetermined angular position.

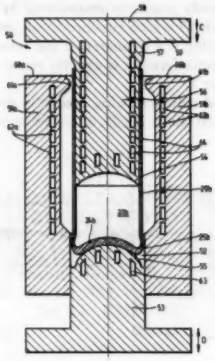
4,512,735
APPARATUS FOR BLOW MOLDING A CONTAINER HAVING AN UPWARD BULGED BOTTOM

Torsten Nilsson, Löddeköpinge, and Kjell M. Jakobsen, Skanör, both of Sweden, assignors to PLM AB, Malmo, Sweden

Filed Nov. 23, 1982, Ser. No. 443,938
Claims priority, application Sweden, Nov. 26, 1981, 8107044
Int. Cl.³ B29C *1/00;* **B29D** *23/03*
U.S. Cl. 425—526 **12 Claims**

1. Apparatus for forming a container from a cylindrical preform having a side wall and a bottom closure, said apparatus comprising an internal mandrel on which the preform is fitted, a mold including two mold halves, and a bottom part in said mold in axial opposition to said mandrel, said mandrel and bottom part being movable axially of the mold relative to each other and relative to the mold halves for shaping the preform into a container, said mandrel having a concave end surface, said bottom part having a convex end surface facing said concave surface for enclosing and reshaping the bottom closure of the preform, said mold halves together defining a mold inner surface for engaging the wall of the preform at the outer surface thereof proximate said end closure, said mandrel having an outer surface engaging the wall of the preform at the inner

surface thereof, the engagement of the inner and outer surfaces of the preform in region of said end closure being without clearance to maintain the wall thickness of the preform during reshaping of the bottom closure of the preform, said end surfaces of said mandrel and said bottom part including respective central regions which a opposite one another and define a substantially uniform gap for engaging the inner and outer surfaces of the bottom closure of the preform to turn the bottom closure inwardly, said end surfaces further including peripheral regions which are opposite one another and of differing curvature to form an annular ring-shaped region in which the material of the preform in a ring-shaped transition region between the inwardly bulged bottom closure and the side wall is stretched and becomes oriented so that the inward bulged shaped of the bottom closure is stabilized and prevented from turning inside-out said bottom part being positionable within said mold inner surface such that said mold inner surface and said convex end surface define an annular molding recess therebetween.



4,512,736

APPARATUS FOR THE EXPANSION OF MINERAL MATTER, ESPECIALLY PERLITE AND VERMICULITE

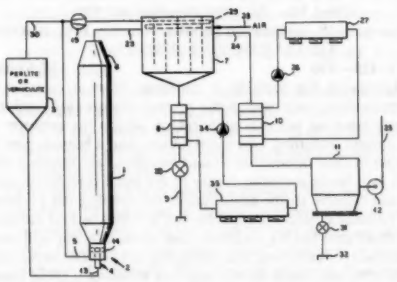
Heribert Wader, Herdecke, Fed. Rep. of Germany, assignor to Deutsche Perlite GmbH, Dortmund, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,758

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151164

Int. Cl.³ F27B *15/00, 14/00*

U.S. Cl. 432—58 **3 Claims**



1. An apparatus for the expansion of particles of a mineral such as perlite and vermiculite, comprising:

means forming an upwardly extending fluidized-bed furnace for expanding said particles;

a burner opening into a lower end of said furnace for generating a flame therein, said furnace being closed at said lower end except for said burner; and

a pipe opening upwardly into said furnace at said lower end for feeding a mixture of said particles and a carrier gas into said flame whereby said particles pass generally in the direction of propagation of said flame through said flame into said furnace, said burner opening axially from below into said furnace and consisting of an annular fuel inlet duct coaxially surrounding said pipe and directed upwardly into said furnace, a combustion air duct opening axially upwardly into said furnace and at least one fuel inlet and coaxially surrounding said fuel inlet assembly, means for feeding fuel exclusively to said fuel inlet duct and means for feeding exclusively air to said combustion air duct, and said combustion air duct being formed with a ceramic ring around said fuel inlet duct and provided with a plurality of spaced apart axially extending bores opening into said furnace and parallel to said pipe and said fuel inlet duct, said ring having a planar horizontal upper surface, said pipe projecting upwardly beyond said surface.

4,512,737

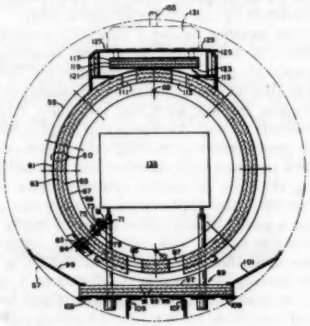
HOT ZONE ARRANGEMENT FOR USE IN A VACUUM FURNACE

Clifford R. Pierce, Perkasie, Pa., assignor to Vacuum Furnace Systems Corporation, Souderton, Pa.

Filed May 23, 1983, Ser. No. 496,970

Int. Cl.³ F27B *5/04*

U.S. Cl. 432—205 **3 Claims**



1. A hot zone arrangement for use in a vacuum furnace, wherein said vacuum furnace has a housing and a means for selectively introducing cooling gas to effect cooling of a workpiece, comprising in combination: circular heating element means formed to have an external boundary and adapted to have electrical energy supplied thereto to generate heat; circular hot zone means having upper and lower sections and heat insulation means, said circular hot zone means disposed to substantially encircle said external boundary of said circular heating element means, thereby holding heat, generated by said heating element means, within said hot zone means; said hot zone means formed to have first and second aperture means in the periphery of said upper section and third and fourth aperture means in the periphery of said lower section; heat reflecting means disposed to lie outside said hot zone means and disposed to lie in close proximity to a tangent point of the circular hot zone, which tangent point is between said third and fourth aperture means such that heat passing from said hot zone means through said third and fourth aperture means is largely reflected back into said hot zone means

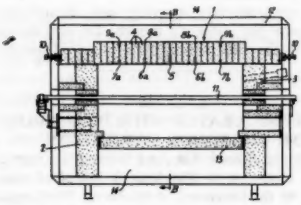
through said third and fourth aperture means; heat reflecting baffle means disposed to lie outside said hot zone means and in close proximity to a tangent point of the circular hot zone means, which tangent point is between said first and second aperture means such that heat passing from said hot zone means through said first and second aperture means is largely reflected back into said hot zone means through said first and second aperture means; channel forming means formed to have heat reflecting internal surfaces and formed to fit over said heat reflecting baffle means and over said first and second aperture means such that heat which is not reflected into said hot zone means by said heat reflecting baffle means will be reflected through said first and second aperture means by said heat reflecting internal surfaces, said channel forming means further formed to have an exit aperture therein disposed such that said heat reflecting baffle means is intermittent between said exit aperture and said first and second aperture means whereby cooling gas passing through said hot zone means and through said first and second aperture means will flow through said channel forming means, around said baffle means, out said exit aperture; gas drawing means formed and disposed to draw gas through said exit aperture whereby when a workspace is to be cooled, cooling gas is introduced into said vacuum furnace housing and passes through said third and fourth aperture means, passes through said hot zone means, comes in contact with said workpiece, passes through said first and second apertures, around said baffle means and into said gas drawing means.

4,512,738

HIGH-TEMPERATURE KILNS

Michel Hartmann, Hericourt, France, assignor to Societe d'Etudes et de Constructions Electriques et Mecaniques Secem, Paris, France

Filed Nov. 4, 1983, Ser. No. 549,184
Claims priority, application France, Nov. 19, 1982, 8219402
Int. Cl.³ F27D *1/00*; F23M *5/06*
U.S. Cl. 432—247 **11 Claims**



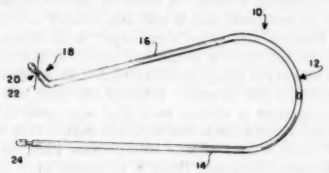
1. A high-temperature kiln, having a top wall or vault formed of ceramic bricks, wherein said top wall is in the form of a planar vault, said vault being comprised of said bricks, and said bricks are refractory bricks having a rectangular profile placed side-by-side, springs resting against a rigid external structure and subjecting said bricks to a resilient lateral compression thrust from said springs, said top wall being provided at intervals with narrow longitudinal notches in at least one of its lower and upper faces, the depth of said notches in the underface decreasing from the central region of the top wall towards lateral edges of said wall while the depth of the notches in said upper face of said top wall increases from its central region towards said lateral edges.

4,512,739

ORTHODONTIC RUBBER BAND APPLICATOR

Steven J. Kaniadakis, Tierra Verde Island, Tierra Verde, Fla. 33715

Filed Oct. 11, 1983, Ser. No. 540,321
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—3 **4 Claims**



1. A hand device of the type designed to facilitate yielding interconnection of upper and lower sets of orthodontic braces, or yielding intraconnections within upper or lower sets, by means of rubber band members, wherein the improvement comprises,

an elongate rod-like member having a bend formed substantially midlength thereof,

said bend being greater than 180 degrees so that a first arm member is obliquely disposed relative to a second arm member that is oriented in a generally horizontal plane when the device is in use,

said first and second arm members lying in a common vertical plane when said device is oriented for use,

said first arm member having a substantially 45-degree bend formed adjacent its distal end so that said distal end is disposed in diverging relation to the unbent distal end of said second arm member,

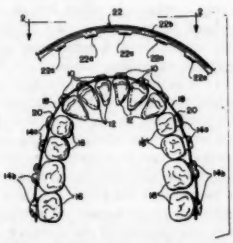
the respective distal ends of said first and second arm members having cooperatively positioned annular rubber band receiving groove means formed therein to maintain a rubber band in its open configuration when diametrically opposed portions thereof are engaged in said respective groove means.

4,512,740

PLASTIC SHIELD FOR ORTHODONTIC APPLIANCE

Craven H. Kurz, 465 N. Roxbury Dr., #1011, Beverly Hills, Calif. 90210

Filed Mar. 7, 1984, Ser. No. 587,220
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—22 **2 Claims**



1. A shield for an orthodontic appliance to protect the oral tissue of a patient from irritation when the patient is wearing the appliance, the appliance comprising a plurality of orthodontic attachments and an arch wire extending between the attachments, and a shield comprising an elongated arcuate member having a smooth outer face, and a plurality of fingers integral with said member and extending around the arch wire to engage the arch wire and hold the member in place covering the attachments of the appliance.

4,512,741

DENTAL INDICATING PASTE AND METHOD OF USE

James T. Mushta, 23014 Atlas Rd., Bothell, Wash. 98011

Filed Aug. 20, 1981, Ser. No. 294,637
Int. Cl.³ A61C *1/00*
U.S. Cl. 433—70 **10 Claims**

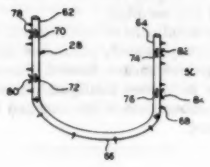
1. An aerosol dental indicating paste for detecting high spots on dental articles, wherein the paste comprises oils blended with indicating powder to form an easily displaceable paste which is non toxic, and is soft and creamy at room temperature, wherein said paste is packaged in an aerosol spray can means mixed with a propellant which is normally a liquid while within the spray can and which is normally a gas at room temperature and pressure, wherein the type and quantity of said propellant is chosen such that said paste is dispensable from said aerosol can in the form of a mist of very fine particles which form a layer of said soft, creamy paste on said dental article when dispensed thereon to enable high spots on said dental article to be detected by displacement of said soft, creamy paste; and wherein said oils in said paste are soluble in said propellant in said aerosol can to enable said paste to be liquified to be dispensed in the form of a mist of fine particles, and wherein said paste is in a soft and creamy, easily displaceable paste phase once again after being dispensed onto said dental article.

4,512,742

HOLDER FOR RUBBER DENTAL DAM

Kathleen A. Shanel, 428 Park Blvd., Glen Ellyn, Ill. 60137

Continuation of Ser. No. 790,567, Apr. 25, 1977, Pat. No. 4,215,477. This application Oct. 16, 1979, Ser. No. 85,252
Int. Cl.³ A61C *5/12*
U.S. Cl. 433—136 **4 Claims**



1. A human facial frame means for holding a dental dam, said frame means being generally U-shaped with an arcuate bottom frame member with means comprising two upright members, said bottom member being adapted to extend around and in front of a human mandible, said arcuate bottom member being adapted to be wide enough to span the entire chin and mandible area and to fit on opposite sides of a patient's face, the uprights having a relatively short length so that they do not rest on the cheek bone, said arcuate bottom member further being adapted to surround a substantial arcuate portion of a patient's mandible, extending substantially from the molar area on one side to the molar area on the other side of the mandible, said two upright members of the U-shaped frame means being adapted to be positioned on opposite sides of the face and head, the width and angle of the uprights being adapted to cause said uprights to come to rest in a position where the upright members are generally parallel to a facial plane which is defined by the patient's nasion and the pogonion, said two upright members being adapted to be located at positions in the range of approximately one-quarter of the distance extending from the ear toward the facial plane, the origin of the two upright frame members being adapted to be located on opposite sides of the patient's head and over approximately the gonion, the bottom of the U-shaped means being adapted to rest on and pivoted around the pogonion in the front of the chin, the two upright frame members having said relatively short length which is adapted to have a top end which is well below and away from the patient's eyes in the direction of the ears when said uprights are in said resting position, a plurality of outwardly projecting means for securing a dental dam around the periphery of the U-shaped frame means, and means on the frame for adapting it to be anchored in place about a patient's head.

4,512,743

METHOD FOR MASKING DISCOLORATION ON TEETH

Edward A. Santucci, Plainsboro, and William B. Racz, Milltown, both of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Feb. 5, 1982, Ser. No. 346,348
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—217 **3 Claims**

1. A method for masking discoloration on a tooth comprising the steps of:

(a) etching the surface of a tooth to be treated with an etching composition, said surface being substantially free of surface film;

(b) cleaning the etched tooth surface to remove the etching composition and debris;

(c) drying the etched tooth surface; and

(d) coating the dry etched tooth surface with a polymerizable composition having a viscosity at 24°+1° C. of 100,000 to 300,000 centipoises, said polymerizable composition comprising liquid polymerizable acrylic ester monomer, a polymerization initiator for said monomer, submicron silica filler, and a color concentrate containing pigments appropriate to match the appearance of the natural tooth enamel, the proportion of said filler being selected so as to impart levelling and nonslump properties to said polymerizable composition.

4,512,744

METHOD ENABLING RAPID IDENTIFICATION OF HUMANS AND ANIMALS

Bruce T. Michnick, Plainview, and Stanley Kitzis, Woodbury, both of N.Y., assignors to Dentistry Researchers & Designers, Inc.

Filed Oct. 28, 1983, Ser. No. 546,375
Int. Cl.³ A61C *3/00*; A61B *1/24*
U.S. Cl. 433—229 **6 Claims**

1. A method enabling identification of human and animal subjects, comprising the steps of:

a. first, permanently affixing an indicia of identification information at a location within a face surface of a tooth of the subject which can be viewed by another looking into the subject's mouth; and

b. second, electronically scanning said identifying indicia from outside the subject's mouth, for non-destructively out-putting the information thereby stored thereon.

4,512,745

FLIGHT SIMULATOR WITH DUAL PROBE MULTI-SENSOR SIMULATION

Windell N. Mohon, Athens, Ala., and William T. Harris, Winter Park, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1983, Ser. No. 495,188
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—43 **11 Claims**

1. An apparatus for simulating multisensor imagery for use with a simulated vehicle, comprising, in combination:

means for providing simulated terrain;

means for generating a first video signal representative of said simulated terrain;

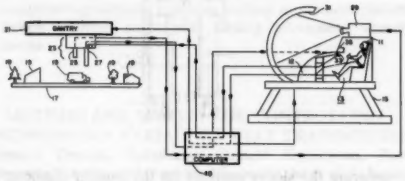
means for generating a second video signal representative of said simulated terrain, said means having a fixed spatial relation to said means for generating a first video signal, and an angular relation thereto variable therefrom in response to control signals input to said vehicle;

means for positioning said first video signal generating means and said second video signal generating means in

relation to said simulated terrain in accordance with control signals input to said simulated vehicle;

means for correlating control signals input to said vehicle with said positioning means operable connected therebetween;

means for converting said first video signal means into an image displayed as an optical image of said terrain in



relation to said vehicle, operably connected to receive input from said first video signal generating means;

means for converting said second video signal into a negative image separately displayed within said simulated vehicle as a simulated forward-looking infrared sensor display, operably connected to receive inputs from said second video signal generating means.

4,512,746

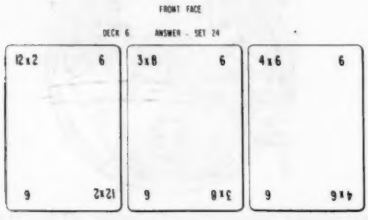
MATHEMATICAL TEACHING CARDS

Donald Turner, 16 Bradley Ct., Rockville, Md. 20851

Filed Sep. 15, 1982, Ser. No. 418,203

Int. Cl.[3] G09B *19/02*; A63F *1/00*

U.S. Cl. 434—209 **6 Claims**



1. A series of multiplication table teaching cards having a plurality of decks of cards, each card having a front side and a back side, and each deck having;

a different subgroup of multiplication statements,

a plurality of sets of cards within each deck, each set including a plurality of cards, with each card within a set having a simple multiplication statement on the front side, and having an unstated answer which is the same answer as that of other cards within said set, and

said plurality of decks of cards being divided into sub-pluralities of decks, each sub-plurality having a different level of difficulty and having distinctive indicia indicating the level of difficulty of said sub-plurality.

4,512,747

MATERIAL CONVEYING SYSTEM SIMULATION AND MONITORING APPARATUS

Max W. Hitchens, 532 Timber Ridge Dr., #301A, and George B. Rote, 614 Willow Wood Dr., #107, both of Carol Stream, Ill. 60187

Filed Jan. 13, 1982, Ser. No. 339,139

Int. Cl.[3] G09B *25/02*

U.S. Cl. 434—428 **9 Claims**

1. An apparatus for emulating the operation of a material conveying system, which includes discrete material handling and sensing components, said apparatus including:

digital simulator means for storing, in a non-volatile manner, data representing discrete components of a material conveying system;

means for interfacing said apparatus to an independent control device which operates and controls a material conveying system;

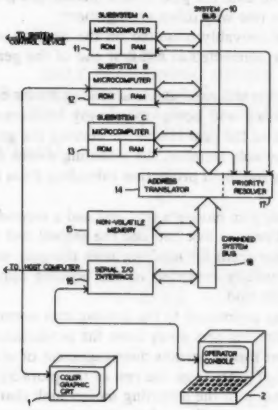
means under operator control for interactively operating said digital simulator means for causing said control device to respond as if a material conveying system was conveying material when said material conveying system is not conveying material, and said interactive operation including starting, stopping and incremental stepping modes; and

means for graphically displaying the simulated operation of a material conveying system by periodically depicting the position of material moving within a material conveying system and the condition of the discrete components.

5. A plant control system comprising:

(a) a material conveying system which includes discrete material handling and sensing components;

(b) independent control means for operating and controlling said material conveying system;



(c) emulator apparatus means for cooperating in operating said system and for comparing the actual operation of said material conveying system with an idealized mode of operation of an idealized material conveying system, said emulator means including:

(1) digital simulator means for storing data representing discrete components of said material conveying system in a non-volatile manner;

(2) means for interfacing said emulator apparatus and said independent control means;

(3) means for comparing data from the actual operation of said material conveying system with data generated in said simulator means;

(4) means for issuing an alarm in the event that the actual data is not within predetermined operating tolerances of the simulated data.

(5) means for graphically displaying the operation of the material conveying system by periodically depicting the position of material moving within the material conveying system and the condition of the discrete components, wherein said discrete components include said discrete material sensing components; and

(6) means under operator control for interactively manipulating stored data representing discrete components of the material conveying system and operating tolerances.

4,512,748

MECHANICAL PENDANT

Hajime Matsumoto, Nagareyama, and Yoichi Abe, Funabashi, both of Japan, assignors to Toybox Corporation, Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,480
Claims priority, application Japan, Mar. 1, 1982, 57-27121[U]
Int. Cl.³ A63H 13/00
U.S. Cl. 446—354 7 Claims

1. An amusement device, comprising:

(a) a housing;

(b) gear means connected to the housing having a first end and a second end, the gear means including a plurality of gears and a one-way drive arrangement;

(c) a member movably mounted on the housing and being operatively connected to the first end of the gear means; and

(d) compressible and expandable actuating means connected to the housing and being operatively connected to the second end of the gear means for moving the gear means and the movable member, the actuating means including

(i) a fixedly mounted projection extending from the housing;

(ii) a driving arm having a first end and a second end, the first end being a free end and the second end terminating in gear teeth for meshing with the gear means and being pivotally mounted to the housing opposite the projection; and

(iii) a spring connected to the driving arm normally biasing the driving arm away from the projection,

wherein the gear means permits disengagement of at least one of the plurality of gears from the rest of the plurality of gears during compression of the actuating means such that the one-way drive arrangement allows the actuating means to be compressed without moving the movable member and yet will permit moving of the movable member when the actuating means expands.

4,512,749

SYSTEM OF ARTICULATED LEGS FOR TOY FIGURES

Jorge Magri Deulofeu, Barcelona, Spain

Filed Nov. 5, 1982, Ser. No. 439,559
Claims priority, application Spain, Nov. 6, 1981, 261281[U]
Int. Cl.³ A63H 3/36, 3/12
U.S. Cl. 446—390 5 Claims

1. An improved leg assembly for attachment to the body cavity of a toy figure comprising:

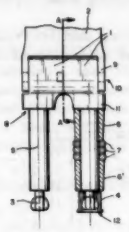
(a) a first section for connection to the body cavity of a toy figure to form an articulated joint therewith;

(b) a pair of major diameter sections extending from the first section for simulating the bottom portion of a pair of shorts;

(c) a smaller diameter section of cylindrical configuration, and including a free end, extending from each major diameter section for simulating the legs of the figure;

(d) plural sleeve sections of different colors slidably received on each smaller diameter section for simulating flesh coloration and socks worn by the figure; and

(e) means engageable onto the free end of each smaller diameter section for simulating the feet of the figure and



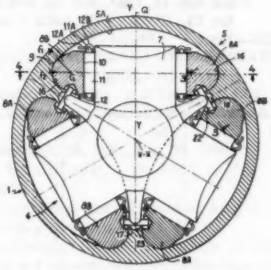
securing the sleeve sections on the smaller diameter sections.

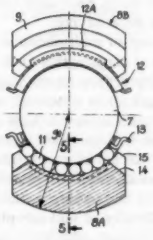
4,512,750

TRANSMISSION JOINT AND IN PARTICULAR AN ARTICULATED CONSTANT-SPEED JOINT FOR A MOTOR VEHICLE

Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Apr. 8, 1983, Ser. No. 483,843
Claims priority, application France, Apr. 20, 1982, 82 06768
Int. Cl.³ F16D 3/24
U.S. Cl. 464—111 18 Claims





1. A constant-speed transmission joint for transmitting rotation of a driving shaft to a driven shaft while enabling angular displacement therebetween, said joint comprising:

a barrel element rigid with the driven shaft, said barrel element defining therein three pairs of tracks;

a tripod element rigid with the driving shaft and rotatable thereby about an axle, said tripod element extendng into said barrel element and having three radially extending arms;

three rolling means rotatively mounted on respective said arms for transmitting rotation of said tripod element to said barrel element while enabling angular displacement of said axis of said tripod element relative to the axis of rotation of said barrel element;

each said rolling means comprising two separate roller sectors disposed on opposite sides of a respective said arm and cooperating with a respective said pair of tracks; and

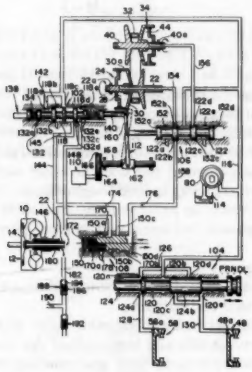
each said roller sector and the respective said track having cooperating surfaces enabling rolling movement therebetween without substantial sliding movement therebetween.

4,512,751

METHOD AND SYSTEM FOR CONTROLLING CONTINUOUSLY VARIABLE V-BELT TRANSMISSION

Yoshikazu Tanaka, Yokohama; Sigeaki Yamamuro, Zushi; Hiroyuki Hirano, and Yoshiro Morimoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 26, 1982, Ser. No. 362,490
Claims priority, application Japan, Mar. 28, 1981, 56-44747
Int. Cl.³ F16H *11/06*
U.S. Cl. 474—28 **3 Claims**



1. A system for controlling a continuously variable transmission having a V-belt connecting a drive and a driven pulley, said drive pulley having a first cylinder chamber and first and second conical discs, said driven pulley having a second cylinder chamber and third and fourth conical discs, the first conical disc being secured to a drive shaft, the third conical disc being secured to a driver shaft, the second conical disc being controllably movable in an axial direction with respect to the drive shaft in response to a fluid pressure in the first cylinder chamber, the fourth conical disc being controllably movable in an axial direction with respect to the driven shaft in response to a fluid pressure in the second cylinder chamber, the hydraulic control system comprising:

means for supplying hydraulic fluid to said first and second cylinder chambers; and

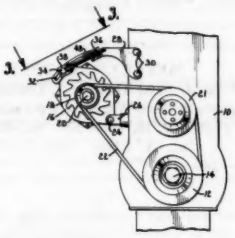
a shift control valve means connected to said supplying means for receiving the hydraulic fluid and for regulating a fluid supply to and discharge from the first and second cylinder chambers, said shift control valve means having a valve bore formed with a first port connected to receive the hydraulic fluid from said supplying means, a second port communicating with the first cylinder chamber and a third port communicating with the second cylinder chamber, the second and third ports being spaced from and disposed on opposite sides of the first port, the shift control valve means including a spool means operable for maintaining the fluid pressure within said first cylinder chamber substantially constant when varying the fluid pressure within said second cylinder chamber and for maintaining the fluid pressure within said second cylinder chamber substantially constant when varying the fluid pressure in said first cylinder chamber, said spool means being slidable within the valve bore, the spool means having a first land and a second land which cooperate with the second and third ports respectively, the first and second lands having axial lengths which are shorter than axial widths of the second and third ports respectively, and wherein an axial distance between outer side edge faces of the first and second lands is substantially equal to an axial distance between outer side walls of the second and third ports, such that said first and second lands cooperate with said second and third ports in a first position to provide a substantially equal pressure to both the first cylinder chamber and the second cylinder chamber, and such that, as said spool begins to move in a first direction from said first position, the pressure in one of said cylinder chambers constantly varies while the pressure in the other of said cylinder chambers remains constant, and as said spool begins to move in an opposite direction from said first position, the pressure in the other of said chambers constantly varies while the pressure in said one chamber remains constant.

4,512,752

BELT TENSIONING DEVICE

Gary W. Brenneman, Rte. 2, Meadville, Mo. 64659

Filed Jan. 3, 1983, Ser. No. 454,979
Int. Cl.³ F16H *7/14*
U.S. Cl. 474—114 **15 Claims**



1. A field installed tensioning device for an engine driven drive belt engaging an accessory pulley which serves to drive an accessory mounted on the engine for angular adjustment about a pivot axis to adjust the belt tension, said device comprising:

a slotted plate mounted on the engine and having an arcuate slot formed about said pivot axis;

first and second brackets;

a first bolt connecting said first bracket to said slotted plate;

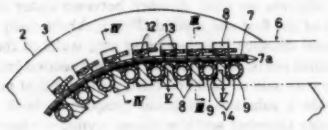
a second bolt extending through said second bracket and said slot and engaging said accessory, said second bolt having a loose condition permitting angular adjustment of the second bracket and accessory about said pivot axis to vary the belt tension as said second bolt moves in said slot, and a tight condition wherein the second bolt secures the second bracket and accessory against movement relative to the slotted plate; and

a screw extending between said brackets, said screw having a head end connected to one bracket in a manner to be capable of turning relative thereto and being in threaded engagement with the other bracket, whereby turning of the screw while said second bolt is in the loose condition effects movement of said brackets toward and away from one another to vary the belt tension.

4,512,753
V-BELT TRANSMISSION APPARATUS

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,285
Claims priority, application Japan, Mar. 14, 1983, 58-40782; Mar. 14, 1983, 58-40783; Mar. 14, 1983, 58-40784
Int. Cl.[3] F16G 5/16, 5/22
U.S. Cl. 474—242 8 Claims



1. A V-belt assembly for use in a V-belt transmission, said V-belt assembly comprising:

(a) an endless belt;

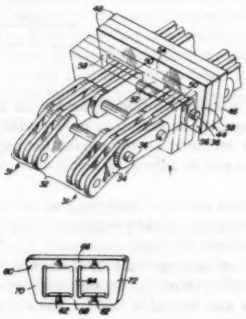
(b) a plurality of V-shaped members disposed along said belt in the longitudinal direction thereof, each of said members having a belt engaging surface facing said belt and pulley engaging surfaces for engaging the surfaces of pulleys in the transmission; and

(c) a plurality of intermediate members, each intermediate member being interposed between adjacent V-shaped members on the inside of said belt, said intermediate members being held between corresponding adjacent V-shaped members by intermediate member engaging surfaces thereof, wherein said intermediate members are movable towards and away from said belt along said intermediate member engaging surfaces.

4,512,754
METAL CHAIN-BELT

Edward H. Cole, Jr., and Timothy J. Ledvina, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 18, 1983, Ser. No. 485,781
Int. Cl.[3] F16G 13/08, 5/18
U.S. Cl. 474—245 11 Claims



1. A chain-belt especially adapted to drivingly connect pulleys of a pulley transmission, said chain-belt comprising:

a plurality of transversely arranged sets of links, adjacent sets of links being interleaved with one another;

pivot means joining said adjacent sets of links to provide an endless assembly of links;

a plurality of load blocks, each of which is located between a pair of pivot means,

each load block having edges adapted to frictionally engage the pulleys of the pulley transmission,

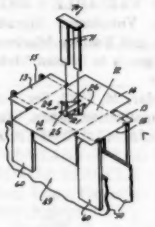
each load block defining at least a pair of windows defined by an upper and a lower transverse span and an integral column which joins said spans and separates said windows,

each load block windows encircling the links of one set of links, with said load block column separating some links of said one set of links from other links of said one set of links.

4,512,755
APPARATUS FOR ERECTING A BOTTLE CARRIER

Orison W. Stone, Middlebury, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Filed Mar. 7, 1983, Ser. No. 473,012
Int. Cl.[3] B31B 1/44
U.S. Cl. 493—92 4 Claims



1. Apparatus for forming a carrier,

longitudinal formers spaced apart to form a longitudinal slot for receiving and folding a central partition,

formers across the ends of said longitudinal slot for engaging transversely-creased end walls to erect said end walls,

said end formers being spaced longitudinally from said longitudinal formers to provide transverse slots for the formation of gussets between said central partition and end walls,

a thin plunger,

means for passing said plunger into said longitudinal slot and between said end formers,

said thin plunger being engageable with said central partition to drive it into said longitudinal slot thus folding said central partition upon itself and simultaneously effecting partial erection of said carrier by said longitudinal and end formers simultaneously applying forces to said central partition and end walls.

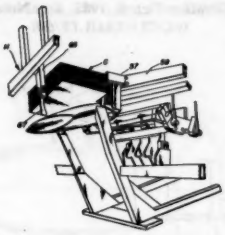
4,512,756
APPARATUS FOR FEEDING FROM A HOPPER AND FOR SETTING UP COLLAPSED ARTICLE CARRIERS

Willie M. Fields, Griffin, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 25, 1982, Ser. No. 342,179
Int. Cl.[3] B31B 1/78, 1/80
U.S. Cl. 493—312 5 Claims

1. Apparatus for feeding out of a hopper and for setting up a collapsed article carrier of the top gripping type initially stacked in the hopper with face contacting upper and lower planar elements comprising a pair of handle panels and a pair of side walls foldably joined to said handle panels respectively with outwardly collapsed end walls foldably joined to the ends of said side walls and wherein the lower one of said handle panels is formed with notches on opposite edges thereof, a pair of inwardly extending projections fixedly mounted on said hopper and in engagement with the parts of the upper one of said handle panels which coincide with said notches, each of said inwardly extending projections including a fixed base portion and a yieldable end portion which directly engages said parts of said upper handle panel, at least one notch formed on the bottom edge of the lower one of said side walls and at least one inwardly extending projection fixedly mounted on

said hopper and arranged to engage the part of the upper one of said side walls which coincides with said notch, feeder means engageable with said lower planar element for imparting movement thereto in a direction away from said upper



planar element thereby to initiate setting up of the carrier, and a pair of fixedly mounted guides disposed in spaced relation to each other and arranged to engage said end walls respectively following release of the carrier from the hopper thereby to aid in setting up the carrier.

4,512,757

DOUBLE-SEAM BAG-MAKING METHOD AND APPARATUS WITH OFFSET STACKING

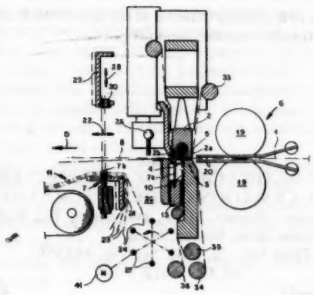
Karl Dreckmann, Hennef-Altenbödingen, Fed. Rep. of Germany, assignor to M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Jan. 6, 1983, Ser. No. 455,904

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201170

Int. Cl.³ B31B *23/00*

U.S. Cl. 493—194 **12 Claims**



1. An apparatus for making bags from a multilayer synthetic-resin strip workpiece, the apparatus comprising:

transport means for conveying the workpiece longitudinally in a transport direction along a path;

an upper welding element along the path having relative to the direction an upper upstream welding tool extending across the path and generally parallel thereto an upper downstream welding tool;

respective lower upstream and downstream welding tools vertically aligned with the upper upstream and downstream tools;

a blade extending transverse to the path between one of the upstream tools and the respective downstream tool;

means for relatively vertically displacing the upper and lower tools with the workpiece between them toward one another to weld the workpiece together along upstream and downstream seams at the respective tools and to cut the workpiece across with the blade between the seams, and away from one another to free the severed downstream end section of the workpiece;

stacking means including a stack support downstream of the tools for catching and holding the severed end sections in a stack; and

means for displacing the stack support in the transport direction synchronously with displacement of the tools for offsetting the trailing ends of succeeding severed end sections in the stack.

4,512,758

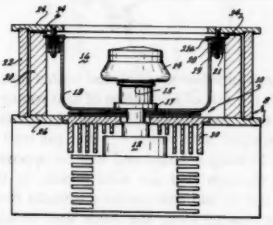
THERMOELECTRIC TEMPERATURE CONTROL ASSEMBLY FOR CENTRIFUGES

Robert C. Wedemeyer, San Francisco, and Robert H. Giebeler, Jr., Cupertino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 30, 1984, Ser. No. 605,360

Int. Cl.³ B04B *15/02*

U.S. Cl. 494—13 **23 Claims**



17. A thermoelectric temperature control system for a centrifuge of the type having a rotor, a temperature controlled vessel, and a housing that at least partially encloses the vessel, including:

(a) a heat sink positioned under said vessel and supported by said housing,

(b) a thermoelectric temperature control assembly comprising:

(i) a nonconducting substrate, and

(ii) at least one thermoelectric device attached to the substrate,

(c) said assembly being positioned between the vessel and the heat sink so that the upper surface of the thermoelectric device is in direct thermal contact with the vessel and the lower surface of the thermoelectric device is in direct thermal contact with the heat sink,

(d) whereby the weight of the vessel lessens the thermal resistance of said thermal contacts.

4,512,759

DEVICE FOR THE SEPARATION OF PARTICLES FROM A STREAM OF GAS

Aloysius J. W. O. Alink, Zevenaar, and Berend P. van Marle, Dieren, both of Netherlands, assignors to Thomassen International B.V., Netherlands

Filed Feb. 9, 1983, Ser. No. 465,089

Claims priority, application Netherlands, Feb. 23, 1982, 8200725

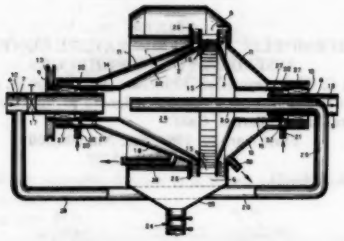
Int. Cl.³ B04B *15/02*

U.S. Cl. 494—14 **5 Claims**

1. A device adapted for the separation of suspended particles from a stream of gas by means of centrifugal force, comprising:

a rotationally symmetrical body provided with an inlet means for the stream of gas to be purified, an outlet means for the purified gas; said body comprising a conical casing and a conical cover both being coaxial and with their apexes turned away from each other such that their opposed bases define a common circumferential and annular opening for discharge of separated particles, the axis of

revolution coinciding with both apexes, the inlet means for the stream of gas being located at the apex of said casing, the outlet means for the purified gas being located at the apex of said cover valve means mounted within the inlet means, so that a part of the incoming gas stream may be diverted, and a branch pipe intersecting the gas inlet means prior to the valve means, so that a part of the incoming gas stream can be diverted into said branch pipe,



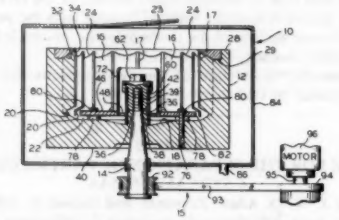
said branch pipe being connected with a pipe lying coaxially with the axis of revolution of said rotating body, said coaxial pipe positioned within said body and having an end positioned with respect to the gas inlet means such that gas flowing out said end will be opposed to the gas flowing through said gas inlet means, so that said gas flowing out of said end creates a toroidal flow pattern of gas to be cleaned along the inside wall of said casing.

4,512,760

METHOD AND DEVICE FOR SELECTIVE SEPARATION OF FINE METAL PARTICLES

William DeNicolo, 6832 N. Mendota, Chicago, Ill. 60646, and Pershing Nakada, 832 Poplar Ave., Elmhurst, Ill. 60126

Filed Jan. 19, 1984, Ser. No. 572,193
Int. Cl.³ B01D *21/26*
U.S. Cl. 494—37 **19 Claims**



1. A process for separating fine metal particles from a mixture of particles including particles having a specific gravity greater than a media substance and particles having a specific gravity less than the media substance, including the steps of:

rotating a container;

placing said media substance in the container to provide a wall of said media substance on the inside surface of said container when the container is rotating; and

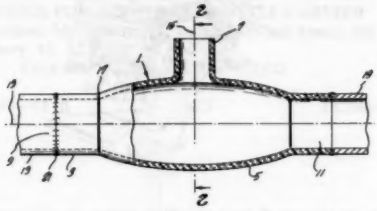
injecting said mixture of particles in said rotating container to flow against said media wall, so that said greater specific gravity particles in contact with the media penetrate the media and said particles having a specific gravity less than the media are rejected by the media.

4,512,761

BODY IMPLANTABLE CONNECTOR

Donald A. Raible, Irvine, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 292,846, Aug. 14, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 539,623
Int. Cl.³ A61B *19/00*
U.S. Cl. 604—8 **12 Claims**



1. A connector to replace a portion of the patient's internal body fluid or solid carrying conduit adapted to connect said body conduit to a vascular implant device for providing external access to said body conduit comprising:

a hollow tubular member of a grafting material, a portion of said tubular member being of expanded diameter to form a hollow bulbous portion positioned along the length of said tubular member, said bulbous portion being of a grafting material and being defined as having a partial elliptical contour, the elliptical contour being elongated substantially along a common center line between an inlet and an outlet to the hollow tubular member, truncated at its ends at the point of diameter expansion from the diameter of said tubular member to form said bulbous portion; and

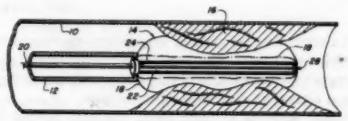
a side port of a grafting material at the approximate midpoint of said tubular member bulbous portion.

4,512,762

METHOD OF TREATMENT OF ATHEROSCLEROSIS AND A BALLOON CATHETER FOR SAME

James R. Spears, Boston, Mass., assignor to The Beth Israel Hospital Association, Boston, Mass.

Filed Nov. 23, 1982, Ser. No. 443,958
Int. Cl.³ A61B *6/08*
U.S. Cl. 604—21 **8 Claims**



1. A method for the treatment of atherosclerosis in a mammal by destruction of atheromatous plaque in a diseased blood vessel, said process comprising:

injecting a hematoporphyrin into the mammal to be treated for selective uptake into the atheromatous plaque;

inserting a light-emitting catheter into the diseased vessel so that the light-emitting portion of the catheter is adjacent the atheromatous plaque to be lysed; and

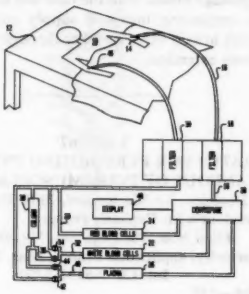
exposing the hematoporphyrin within said atheromatous plaque to light transmitted through the catheter for lysis of the plaque.

4,512,763

METHOD AND APPARATUS FOR SELECTIVE REMOVAL OF CONSTITUENTS OF BLOOD

Barbara Schneider, Philadelphia, Pa., assignor to Gamma Medical Products, Inc., Glen Rock, N.J.

Filed May 4, 1981, Ser. No. 259,971
Int. Cl.[3] A61M 1/03
U.S. Cl. 604—5 19 Claims



1. A method of removing a constituent such as immunoglobulins, lymphocytes, or immune complexes from a component of a patient's blood comprising the steps of:

(a) removing a volume of the patient's blood from a vein;

(b) separating the constituent containing component from the removed blood;

(c) preparing an antibody;

(d) contacting the patient's component with the antibody so that the antibody may adsorb the appropriate constituent from the component;

(e) recombining the antibody contacted component with the other components of the patient's blood; and

(f) injecting the combined components into a vein of the patient; wherein the antibody is prepared by the steps of:

(g) removing a volume of the patient's blood;

(h) separating the component from the removed blood;

(i) removing selected cells from the component;

(j) injecting the removed cells into a non-human animal such as a goat, rabbit or mouse;

(k) delaying sufficient time for the non-human animal to manufacture antibodies to the injected cells;

(l) removing blood from the non-human animal;

(m) separating the same component from the removed non-human animal's blood; and

(n) removing the antibodies from the non-human animal's component.

4,512,764

MANIFOLD FOR CONTROLLING ADMINISTRATION OF MULTIPLE INTRAVENOUS SOLUTIONS AND MEDICATIONS

Richard E. Wunsch, 207 Circle Dr., Traverse City, Mich. 49684

Filed Sep. 27, 1982, Ser. No. 423,978
Int. Cl.[3] A61M 5/14
U.S. Cl. 604—80 8 Claims

1. A manifold assembly adapted for administering a plurality of different intravenous solutions comprising:

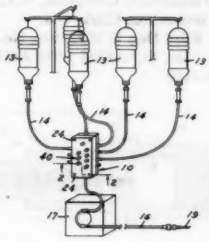
a manifold plate having a pair of generally flat inner and outer surfaces, a pair of side surfaces and a pair of end surfaces, an elongated slot provided in said inner surface and extending from one end surface to the other end surface, said slot being of generally U-shape configuration;

a plurality of branch slots provided in said inner surface and extending from said elongated slot to said side surfaces of the manifold plate; some of said branch slots extending to one side surface and the remaining branch slots extending to the other side surface;

said branch slots being of generally U-shape configuration;

a disposable tubing manifold made of flexible tubing and having a trunk tube disposed in said elongated slot and a plurality of branch tubes equal in number to the number of branch slots disposed in said branch slots, with one branch tube in a branch slot, each branch tube being connected to the trunk tube on a first end and extending from the trunk tube towards one or the other side surface, said branch tubes being connected to said trunk tube to permit fluid flow from the branch tubes to the trunk tube;

female tubing connector means attached to one end of said trunk tube and a second end of each branch tube for



attachment with a male connector of a solution supply tube;

means attached to the other end of said trunk tube for attaching the manifold to an intravenous solution supply tube;

a valve plate having a pair of generally flat inner and outer surfaces, with the inner surfaces of the manifold and valve plates abutting and attached together thereby enclosing said elongated slot and branch slots;

a plurality of valves mounted in said valve plate, with each of said valves having a clamp means movable towards and away from said tubing manifold for selectively engaging and thereby closing said branch tubes and said trunk tube to prevent fluid flow therethrough;

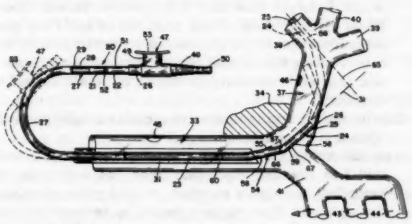
and means for releasing said clamp means to selectively permit fluid flow therethrough.

4,512,765

SELECTIVE TRACHEAL BRONCHIAL CATHETER

Rudolph Muto, 100 Amesbury St., Lawrence, Mass. 01840

Filed Jun. 9, 1983, Ser. No. 502,730
Int. Cl.[3] A61M 16/00, 25/00
U.S. Cl. 604—119 8 Claims



1. A selective bronchial catheter comprising: an elongated, hollow cylindrical tube of uniform diameter, and of flexible material, with an open proximal end and an open distal end having a terminal tip;

said tube having a normally straight elongated, intermediate shank portion, with a central longitudinal axis, and a suction thumb control device extending angularly from one side of said shank portion at said proximal end of said tube;

and a preformed, double bend in said tube, extending angularly from the other side of said shank at the distal end of said tube proximate the terminal tip thereof;

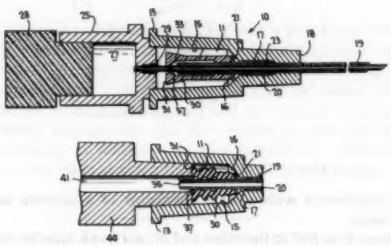
said preformed double bend being located in the area of the bronchial tubes and adapted to cause the open distal end of said tube to enter the left main bronchus and then the left upper lobar bronchus, when inserted in a tracheal tube in the trachea.

4,512,766

CATHETER VALVE

Vincent L. Vailancourt, Livingston, N.J., assignor to Whitman Medical Corporation, Clark, N.J.

Filed Dec. 8, 1982, Ser. No. 447,935
Int. Cl.³ A61M 5/00; A61B 5/00
U.S. Cl. 604—169 **17 Claims**



1. An intravenous catheter assembly, comprising:

a catheter hub having first and second ends and an interior hub chamber which is opened at its first end and is peripherally bounded by a chamber wall;

elongated flow passage means having a near end disposed within said hub chamber and terminating in a remote end beyond said second end of said hub, said near end of said flow passage means being spaced from said chamber wall and having a first pre-determined cross-sectional configuration;

a valve member disposed in said hub chamber about said flow passage means at said near end of said flow passage means for blocking flow between said hub chamber and said near end of said flow passage means, said valve member being made of self-sealing resilient material which permits a needle to be inserted and then withdrawn from a puncture in said valve member from said open end of said hub chamber without destroying the flow blocking capability of said valve member, said valve member having a second pre-determined cross-sectional configuration which is larger than said first pre-determined cross-sectional configuration of said near end of said flow passage means in order to permit the valve member to be forced axially along the outside of said flow passage means with said near end extending through a puncture in said valve member;

bias means for urging said valve member axially toward said open end of said hub;

a needle and needle holding unit adapted to be inserted into said hub chamber from said open end with said needle extending through a puncture in said valve member and through said flow passage means to beyond the remote end of said flow passage means, said needle holding unit including a substantially transparent flashback chamber for receiving blood from said puncture via said needle; and

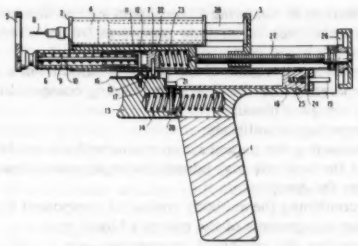
adaptor means adapted to be inserted into said open end of said hub for delivering fluid through said flow passage means after said needle and needle holder unit has been removed, said adaptor means comprising a supply passage having a cross-sectional configuration which is larger than said first pre-determined cross-sectional configuration but smaller than said second pre-determined cross-sectional configuration, whereby forcing said supply passage over said near end of said flow passage means forces said valve member axially in opposition to said bias means along said flow passage means with the near end of said flow passage means projecting into said supply passage through the puncture in said valve member through which said needle had been extended.

4,512,767

APPARATUS FOR PERFORMING INTRADERMAL, SUBCUTANEOUS OF INTRAMUSCULAR INJECTIONS

Raymond Denance, Le Marineland, 2170 Rte. de la Corniche, 83700 Boulouris St. Raphael, France

Filed Mar. 30, 1983, Ser. No. 480,327
Claims priority, application France, Mar. 30, 1982, 82 05380
Int. Cl.³ A61M 5/00
U.S. Cl. 604—137 **3 Claims**



1. An injection device useful either for manual injection or mechanical injection, comprising a cross frame (1) having the shape of a revolver, a removable injection syringe (4) having a syringe piston and at least one needle (8), a syringe cradle securing said syringe to the cross frame (1), means to position the penetration and to predetermine the degree of penetration of said at least one needle, a trigger (13) on the cross frame, a pawl (19) actuated by the trigger, a barrel (26) that is rotated step by step by the pawl upon repeated actuation of the trigger, a screw-threaded axle (27) rotated by the barrel, a screw-threaded slider (3) that is in screw-threaded engagement with said screw-threaded axle (27) and that moves forward upon rotation of said axle, and means (28) interconnecting said slider (3) and said syringe piston to advance said syringe piston stepwise upon repeated actuation of said trigger (13).

4,512,768

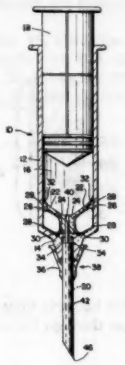
ANALGESIC SYRINGE

Avvari Rangaswamy, Stevens Hospital, Welch, W. Va. 24801

Continuation-in-part of Ser. No. 417,188, Sep. 10, 1982, abandoned. This application Feb. 15, 1983, Ser. No. 466,535
Int. Cl.³ A61M 5/00
U.S. Cl. 604—191 **5 Claims**

1. A syringe, comprising: means for releasing a first pharmaceutical into a porous needle as said porous needle is being inserted in a patient, and said porous needle being in fixed adjacent proximity with a continuous walled cannula or needle through which (1) a second pharmaceutical can be passed or (2) fluids can be withdrawn from the patient;

whereby said first pharmaceutical is infused substantially uniformly into the patient along the length of the inserted



porous needle and therefore into the region which said continuous walled cannula or needle is passed.

4,512,769

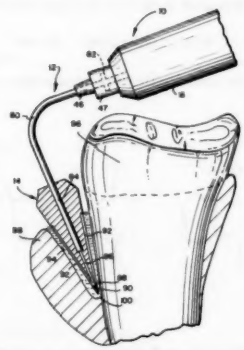
PATIENT EMPLOYED DIGITAL OPERATED SYRINGE DEVICE FOR IRRIGATING PERIODONTAL POCKETS AND OTHER SOFT TISSUE SPACES

George Kozam, 234 E. Clinton Ave., Tenafly, N.J. 07670, and Pat Romanelli, 224 Brook St., Harrington Park, N.J. 07640

Filed Jul. 5, 1983, Ser. No. 510,986

Int. Cl.³ A61M 5/00

U.S. Cl. 604—209 **9 Claims**



1. A periodontal lavage syringe for self-administration of periodontal treatment fluids, comprising

a syringe body portion having at least one fluid retaining bore, a depressible plunger mounted in said bore, and fluid conduit means connecting said bore to a fluid outlet coupling,

an elongated flexible needle attached to and extending from the outlet coupling of said syringe body portion,

a conical nozzle secured to the free end of said needle, said nozzle having a pointed tip, tapered side walls progressively increasing in diameter from said tip to the opposite end thereof, an internal longitudinal bore communicating with the interior of said needle, at least one outlet opening located in the vicinity of said tip and communicating with said longitudinal bore, and a plurality of spaced reflux grooves in the surface of said nozzle extending from said outlet opening to an upper portion of said nozzle, and

manually operable ratchet means mounted on said syringe body portion and operatively coupled to said plunger for depression of said plunger in selected calibrated increments upon manual actuation of said ratchet means by a digit of the hand of the user holding said syringe body portion.

4,512,770

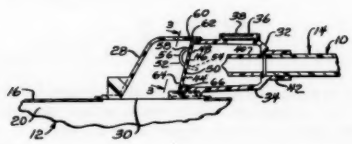
LIQUID DRAINAGE SYSTEM WITH ANTI-REFLUX VALVE

James P. Cianci, Cary, and Terry N. Layton, Arlington Heights, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 27, 1983, Ser. No. 461,350

Int. Cl.³ A61M 1/00

U.S. Cl. 604—323 **7 Claims**



7. A urine drainage system, comprising:

a receptacle having a chamber to receive and collect urine, and a connector attached to a wall of the receptacle and communicating with the chamber;

a drip chamber having a lower portion received in the connector, said drip chamber having a vent with a bacteria filter covering the vent, and an annular wall with a lower, open peripheral edge defining a valve seat, said seat being disposed at an acute angle relative to a horizontal plane when the receptacle is in an upright position, and thus defining a lower seat portion which is located nearest the receptacle and an upper seat portion which is located farthest from the receptacle;

an anti-reflux valve comprising a sheet of flexible material extending over said valve seat, said anti-reflux valve sheet being of sufficiently large dimensions to entirely cover said valve seat, said valve having an upper valve portion, underside and a lower valve portion; and

means for retaining said upper valve portion against said upper seat portion comprising a pair of opposed arcuate retaining arms, each arm having one end secured in a central portion of the drip chamber and extending through central portions of said valve seat and said valve, the arm terminating in an arcuate end engaging against said upper valve portion on the underside thereof and holding it against said upper seat portion.

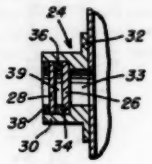
4,512,771

VENTING ASSEMBLY FOR A SEALED BODY FLUID DRAINAGE DEVICE

William J. Norton, Berkeley Heights, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 309,130, Oct. 6, 1981, Pat. No. 4,457,758.
This application Feb. 16, 1984, Ser. No. 580,641
Int. Cl.[3] A61M 1/00
U.S. Cl. 604—824 14 Claims

6. In a closed body urine drainage system having a urine retaining drainage bag with means for communication with a body orifice, a vent assembly, said vent assembly including a filter support surface, a first inner gas permeable, liquid-repellant filter means supported on said support surface, annular spacer means located on said first filter means, a second outer gas permeable bacteria filter means located on said annular spacer means, said spacer means maintaining said second filter means in spaced non-contacting relation to said first filter means, said first filter means being adapted to shield said second filter means from wetting through outward movement of urine from said chamber with the non-contacting relation between the first filter means and second filter means precluding a urine wicking action therebetween and thereby preserving the effectiveness of the bacteria filter barrier while allowing the free passage of gas through the venting assembly.



4,512,772
METHOD OF APPLYING FOAMED DYELIQUORS TO FIBROUS SUBSTRATES OR THE LIKE

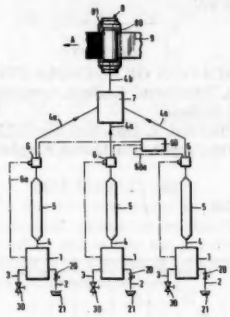
Mathias Mitter, Falkenstr. 57, D-4815 Schloss Holte, Fed. Rep. of Germany

Filed Dec. 15, 1982, Ser. No. 450,109

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150937; Dec. 23, 1981, 3150939

Int. Cl.³ D06B *11/00, 19/00*

U.S. Cl. 8—477 **13 Claims**



1. A method of applying dyeliquors to a moving substrate, comprising the steps of separately foaming differently colored dyeliquors; merging specific proportions of foamed dyeliquors at a collecting location; and applying the thus merged foamed dyeliquors to the substrate, including passing the foamed dyeliquors through the interstices of a screen.

4,512,773
CATIONIC TRIPHENDIOXAZINE DYES, METHODS FOR THEIR MANUFACTURE AND THEIR USE FOR DYEING CELLULOSIC SUBSTRATES

Kenneth Anderton; Nigel Hall; Brian Parton; Andrew H. M. Renfrew, all of Lancashire, and Malcolm G. Shaw, Stirlingshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

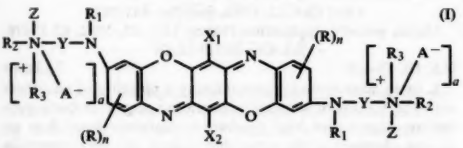
Filed May 10, 1983, Ser. No. 493,262

Claims priority, application United Kingdom, May 24, 1982, 8215052

Int. Cl.³ C09B *19/02*; D06P *3/58*

U.S. Cl. 8—657 **9 Claims**

1. A triphendioxazine dyestuff of blue shade having the formula:



(I)

wherein

X_1 and X_2 are both halogen;

$(R)_n$ represents n substituents R each of which is independently halogen and n is 0 or 1;

R_1 is hydrogen or a lower alkyl group;

Y is a linear or branched aliphatic group containing from 2 to 6 carbon atoms and optionally containing one or more hydroxy or alkoxy substituents;

R_2 is hydrogen, lower alkyl, hydroxy substituted lower alkyl, phenyl, 3- or 4- nitrophenyl, benzyl or beta-sulphatoethyl;

R_3 is hydrogen or a lower alkyl group;

A^- is an anion and a is 1 or 0; and

Z is hydrogen or a lower alkyl group.

4,512,774
RESIDUAL FUEL OIL CONDITIONERS CONTAINING METAL SALTS IN AQUEOUS SOLUTION

John G. Myers, Pittsburgh; Douglas P. Logan, and Jerry L. Walker, both of Coraopolis, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 27, 1978, Ser. No. 973,783

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **13 Claims**

1. A residual fuel oil conditioner for improving combustion and preventing, inhibiting, or removing combustion deposits and corrosion of fuel burning equipment resulting from the burning of residual fuel oils, consisting essentially of an aqueous solution of

a. from 2.0 to 20.0% by weight of at least one water soluble metal salt selected from the halides, sulfates, and nitrates of magnesium, manganese, zinc, copper, lead, iron, nickel, aluminum, calcium and barium; and

b. from 0.1 to 25% by weight of a surfactant having an HLB of 12 to 17.

4,512,775
COLD FLOW IMPROVER

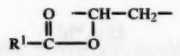
Jackson C. Chen, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 3, 1983, Ser. No. 538,502

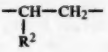
Int. Cl.³ C10L *1/18*

U.S. Cl. 44—62 **22 Claims**

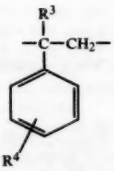
1. A polymer which is effective in lowering the cold flow temperature of middle distillate fuel, said polymer containing (a) about 50 to 90 weight percent of units having the structure $-CH_2CH_2-$, (b) about 10 to 40 weight percent of units having the structure



wherein R^1 is selected from the group consisting of hydrogen and aliphatic hydrocarbon groups containing 1–11 carbon atoms, (c) about 0.2 to 10 weight percent of units having the structure



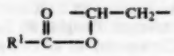
wherein R^2 is an aliphatic hydrocarbon group containing 1–28 carbon atoms and (d) about 1 to 30 weight percent of units having the structure



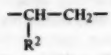
wherein R^3 is selected from the group consisting of hydrogen and methyl and R^4 is selected from the group consisting of hydrogen and aliphatic hydrocarbons containing 1–30 carbon atoms, said polymer having a number average molecular weight of about 1,000–10,000.

12. A distillate petroleum fuel containing an amount sufficient to improve cold flow properties of a polymer having a

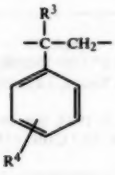
number average molecular weight of about 1,000–10,000 and containing (a) about 50 to 90 weight percent of units having the structure CH_2CH_2, (b) about 10 to 40 weight percent of units having the structure



wherein R^1 is selected from the group consisting of hydrogen and aliphatic hydrocarbon groups containing 1–11 carbon atoms, (c) about 0.2 to 10 weight percent of units having the structure



wherein R^2 is an aliphatic hydrocarbon group containing 1–28 carbon atoms and (d) about 1 to 30 weight percent of units having the structure



wherein R^3 is selected from the group consisting of hydrogen and methyl and R^4 is selected from the group consisting of hydrogen and aliphatic hydrocarbons containing 1–30 carbon atoms.

4,512,776

IONIC POLYMER-POLYLACTONE COMPOSITIONS AS FLOW IMPROVERS FOR OILS AND FUELS

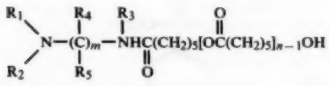
Robert D. Lundberg, Bridgewater, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1983, Ser. No. 565,188

Int. Cl.³ C10L *1/24*

U.S. Cl. 44—62 **38 Claims**

1. A process for decreasing the pour point of hydrocarbon oils and fuels which comprises adding about 25 parts per million to about 1.0 weight percent of said oil or said fuel of a sulfonated polymer to said fuel or said oil, said sulfonated polymer having about 5 to about 100 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer having the formula:

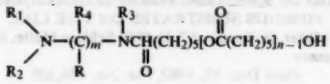


wherein R_1 or R_2 is an alkyl, cycloalkyl heterocyclic or aryl group, R_3, R_4 and R_5 are a hydrogen or alkyl, cycloalkyl, or aryl groups, m equals 1 to 20 and n equals 1 to about 500.

21. A solution which comprises:

(a) a hydrocarbon oil or fuel; and

(b) about 20 to about 10,000 ppm of a polymer sulfonic acid which has about 5 to about 100 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer having the formula:



wherein R_1 or R_2 is an alkyl, cycloalkyl heterocyclic or aryl group, R_3, R_4 and R_5 are a hydrogen or alkyl, cycloalkyl, or aryl groups m equals 1 to 20 and n equals about 1 to about 500.

4,512,777

PURIFICATION OF AQUEOUS EFFLUENTS

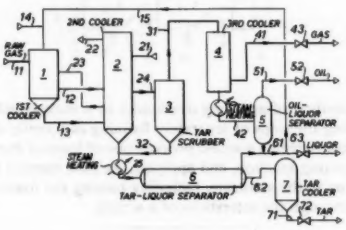
Keith R. Wild, Tamworth, England, assignor to British Gas Corporation, England

Filed Jul. 7, 1983, Ser. No. 511,585

Claims priority, application United Kingdom, Aug. 4, 1982, 8222489

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—210 **4 Claims**



1. In a process for the separation of aqueous and organic condensible tar liquid from a synthesis gas produced by gasification of coal wherein said aqueous and organic tar liquid are condensed out by cooling, said condensation being effected at a pressure within the range 5 to 150 bar, the improvement consisting in effecting separation of the condensate into an aqueous phase and an organic tar liquid phase at a pressure of 5 to 150 bar and at a temperature of 125° C. to 250° C. in a separator.

4,512,778

ADSORPTION PROCESSES

Guy Simonet, and Léon Hay, both of Paris, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 12, 1983, Ser. No. 541,082

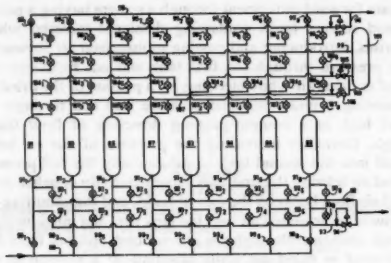
Claims priority, application France, Oct. 22, 1982, 82 17676

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **7 Claims**

1. In an adsorption process utilising a plurality of adsorbers with the following successive operating stages: isobaric production at so-called high pressure in equidirectional flow on several adsorbers at the same time, at least one decompression in equidirectional flow by balancing with another adsorber which is in the course of recompression in contradirectional flow, decompression to intermediate pressure in equidirectional flow, final decompression to so-called low pressure in contradirectional flow, elution at the said low pressure in contradirectional flow, recompression in contradirectional flow by at least one balancing action, final recompression in contradirectional flow by derivation of a part of the production flow, the improvement which consists in that the gas originating from the said decompression to intermediate pressure is fed into a buffer tank and the gas used for elution is drawn from the said buffer tank, and in that each adsorber has an operating cycle delayed by 1/nth of a cycle period (T) with

respect to a preceding one (n being the number of adsorbers), and in that each production stage has a duration of (x/n)T (x being the number of adsorbers in simultaneous production), with "n" greater than or equal to 6, and "x" greater than or



equal to 2, and in that the time period to decompress each adsorber to an intermediate pressure is less than the time period to elute each adsorber, and in that the gas drawn from the buffer tank for elution of an adsorber is supplied to that buffer tank by at least two different adsorbers.

4,512,779

METHOD AND INSTALLATION FOR SEPARATING A COMPOSITE GAS BY ADSORPTION

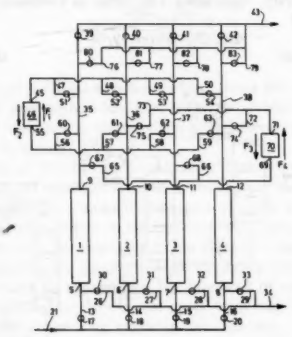
Léon Haÿ, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 31, 1983, Ser. No. 546,852

Claims priority, application France, Nov. 12, 1982, 82 19006

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **14 Claims**



1. A method for separating by adsorption a composite gas constituted by at least two components, said method employing at least three adsorbers in each of which adsorbers are carried out, in a cyclic and staggered manner with respect to time from one adsorber to another adsorber, the following successive operational phases:

(a) a production operational phase with a co-current flow of said composite gas and production of a separated gaseous current and trapping of at least one component in said adsorber with, during a part of said production phase, the bypassing of a fraction of said separated gaseous current for a final counter-current repressurization of a second adsorber in course of repressurization in accordance with phase (g) mentioned below;

(b) a co-current depressurization phase with a drawing-off of a gaseous current for repressurization by balancing at an intermediate pressure level of an adsorber in the course of repressurization in accordance with phase (f) mentioned below, said depressurization phase corresponding to a balancing and being optionally divided into a plurality of depressurization stages, each one thereof, for the repressurization of various adsorbers, at intermediate pressure levels, again in accordance with said phase (f);

(c) a co-current depressurization phase down to a low intermediate pressure with drawing-off of a gaseous current for the purpose of the elution of an adsorber in the course of elution, in accordance with phase (e) mentioned below;

(d) a final counter-current depressurization phase down to a relatively low-pressure;

(e) a counter-current elution phase at regeneration pressure, the elution current coming from an adsorber in the course of depressurization in accordance with phase (c);

(f) a counter-current repressurization phase by balancing of pressures with an adsorber in the course of depressurization in accordance with phase (b), said repressurization phase being optionally divided into a plurality of successive stages by balancing of the pressures with the various adsorbers in the course of depressurization in accordance with phase (b);

(g) a final counter-current repressurization phase, the repressurization current coming from a bypassing of a fraction of the current issuing from an adsorber in course of production in accordance with phase (a);

the improvement wherein the successive balancing phases between a first pair of adsorbers and then a second, different pair of adsorbers are carried out by passing the balancing current from a co-current depressurization phase of one adsorber into one end of an auxiliary column employing a longitudinal segregation of the undesirable component or components, through that auxiliary column and out the other end thereof to a counter-current repressurization phase of another adsorber, currents corresponding to two successive balancings between the adsorbers in said first pair and then between the adsorbers in said second different pair flowing through said column in opposite directions of flow.

4,512,780

PRESSURE SWING ADSORPTION WITH INTERMEDIATE PRODUCT RECOVERY

Andrija Fuderer, Antwerpen, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 8, 1983, Ser. No. 549,746

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **40 Claims**

1. A pressure swing adsorption process for the separation of a feed gas mixture containing a less readily adsorbable component, an intermediately adsorbable component and a more readily adsorbable component, with recovery of said intermediate component as a desired product, in an adsorption system having at least four adsorbent beds, in each of which, on a cyclic basis, undergoes a processing sequence comprising:

(a) introducing the feed gas mixture to the feed end of the adsorbent bed at a higher adsorption pressure, with the less readily adsorbent component being discharged from the product end of the bed, and with a leading adsorption front of said intermediate component of said feed gas mixture being established in the bed ahead of a trailing adsorption front of said more readily adsorbable component of said feed gas mixture;

(b) introducing to the feed end of the bed a displacement gas essentially free of the less readily adsorbent component, the molar concentration of said intermediate and/or more readily adsorbable components being greater in said displacement gas than in the feed gas mixture, said gas being introduced such that the less readily adsorbable component is essentially completely displaced from the bed prior to initiation of intermediate component recovery;

(c) cocurrently depressurizing said bed with discharge of said intermediate component from the product end thereof as a product of desired purity;

(d) countercurrently depressurizing and/or purging the bed to remove said more readily adsorbable component therefrom; and

(e) repressurizing said bed to the higher adsorption pressure, whereby the intermediately adsorbable component can be recovered as a separate product of desired purity rather than being recovered with the least readily adsorbable component, or with the more readily adsorbable component or as a waste stream with said less and more readily adsorbable components.

4,512,781

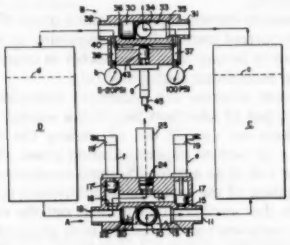
SHUTTLE VALVES AND SYSTEM FOR FLUID CONTROL

Michael J. Caralli, Irwin, and Gary W. Friedline, New Alexandria, both of Pa., assignors to Pittsburgh Brass Manufacturing Company, Irwin, Pa.

Filed Nov. 14, 1983, Ser. No. 551,146

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **17 Claims**



1. A system for automatically drying a gas such as air supplied under pressure thereto and for automatically rejuvenating desiccant used therein which comprises, a pair of drying tanks having desiccant material therein, a moist air input shuttle valve unit and a dry air output shuttle valve unit, each of said valve units having a main through-passageway therein, the main passageway of said input valve unit being connected at its opposite ends to one end of each tank, the main passageway of said output valve unit being connected at its opposite ends to the other ends of each tank, a moist pressurized air input port substantially centrally connected to the main passageway of said input valve unit, a dry air outlet connected substantially centrally to said main passageway of said output valve unit; said input valve unit having a by-pass passageway connected at its ends to opposite outer ends of the main passageway, secondary valve means adapted to open and close off opposite ends of said by-pass passageway with respect to the main passageway, an output discharge port open from said by-pass passageway; primary pressure-sensitive slide valve means for each of said valve units operatively positioned for closing-off opposite ends of the main passageway therein and adapted to shift from one end closing-off position to the other in accordance with difference in air pressure at opposite ends of the main passageway; said output valve unit having a by-pass passageway connected to opposite ends of its said main passageway and adapted to bleed-off a portion of dried air moving into its said main passageway and introduce it alternately in a purging reverse flow into each of said tanks, control valve means operatively carried by said output valve unit and positioned to automatically selectively control the pressure and amount of air flow through its said by-pass passageway, said secondary valve means of said input valve unit being adapted to alternatively open and close-off opposite ends of its said by-pass passageway when its said pressure-sensitive valve means is shifted within said main passageway to alternately close-off flow from said air input port to one of said pair of tanks and to open return flow from the other of said pair of tanks into said by-pass passageway for receiving purging air from the other tank for discharging it from said output discharge port, and said control valve means of said output valve unit being adapted to automatically decrease and then increase the pressure of air flow between opposite ends of its said by-pass passageway.

16. A method for automatically continuously drying a moisture-containing gas such as air supplied under pressure by alternate forward movement through a system having a pair of first and second tanks containing dessicant material which comprises, introducing and passing moisturized air forwardly under pressure through the first tank and out from one end thereof as dried air while bleeding-off a portion of the dried air and moving it under reduced pressure into and through the second tank in a counter-purging direction of flow therethrough, thereafter increasing the pressure of the air being bled-off into the second tank to substantially the full pressure of dried air leaving the first tank to substantially equalize pressure of air flow between the pair of tanks, and then shutting-off the flow of moisturized air into the tank first and introducing it into and passing it through the second tank and out from one end thereof as dried air while bleeding-off a portion of the dried air and moving it under reduced pressure into and through the first tank in a counter-purging direction of flow therethrough, thereafter increasing the pressure of air being bled-off into the first tank to substantially the full pressure of dried air leaving the second tank to substantially equalize air pressure between the two tanks, and then shutting-off the flow of moisturized air into the second tank and again introducing it into and passing it through the first tank and out from the one end thereof as dried air and repeating the defined operations.

4,512,782

MULTISTAGE RECTIFICATION OF GASEOUS HYDROCARBONS CONTAINING SOUR GASES

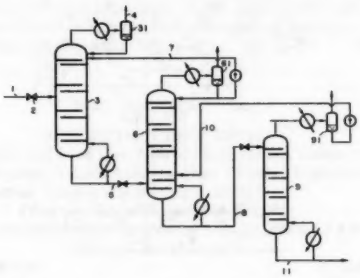
Heinz Bauer, Neuried, and Hans Becker, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,506

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303651

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—48 **19 Claims**



1. A process for the fractionation of a gaseous mixture under pressure, said mixture containing methane, C_2, C_3, C_4+ inert gas, and sour gases comprising hydrogen sulfide, and carbon dioxide, the total of the sour gases being at least 1 mol %, wherein the higher hydrocarbons are separated by rectification as the bottoms product, the improvement comprising conducting the rectification in three rectification stages: in the first rectification stage, separating a head product substantially free of C_{4+} hydrocarbons; feeding the bottoms of the first rectification stage to the second rectification stage, and separating therein further C_{3-} hydrocarbons and a fraction of the hydrogen sulfide as the head product and recycling the second stage head product into the first rectification stage to function therein at least in part as reflux; passing bottoms product of the second rectification stage into the third rectification stage, and

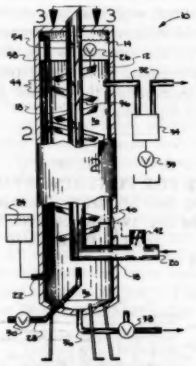
separating residual hydrogen sulfide and residual proportions of C_3– hydrocarbons as the head product; and withdrawing H_2S-free C_{4+} hydrocarbons bottoms product from the third rectification stage.

4,512,783

GAS EXTRACTOR

Charles K. Stevenson, Wichita, Kans., assignor to Midland Gas Extractors, Inc., Wichita, Kans.

Filed Jan. 23, 1984, Ser. No. 573,288
Int. Cl.³ B01D *49/00*
U.S. Cl. 55—160 **10 Claims**



1. An oil well gas extractor which treats the crude oil from the well and utilizes the heat from the exhaust gases of the internal combustion engine driving the pumping unit, the extractor including:

a vertical tank having an extractor chamber therein;

a crude oil reservoir located in the top portions of said tank, a supply line connecting a source of crude to the reservoir;

a first valve means in the reservoir controlling the oil flow rate from the reservoir to the extractor chamber;

an exhaust pipe passing longitudinally up through the vertical tank to atmosphere, the inlet end of the exhaust pipe connected to the exhaust gases from said engine;

temperature sensing means in the chamber;

a second valve means in the exhaust pipe positioned upstream of the tank, opening to atmosphere;

servo means controlled by the temperature sensing means which opens and closes the second valve means so as to bypass the exhaust gases and maintain a constant temperature in the extractor chamber;

a gas outlet passage in the extractor chamber connected to the intake of said engine;

an oil drain line at the bottom of the extractor chamber; the improvement comprising:

a controlled air inlet passage in the extractor chamber; and

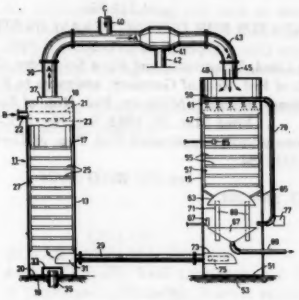
a plurality of baffle pans longitudinally positioned along the exhaust pipe in concentric relation to the axis of the pipe, each adjacent pan being oppositely tilted from the horizontal and having a drain opening in the lower side thereof whereby the oil flowing from one pan to the next flows across the bottom of each pan before draining to the next adjacent pan.

4,512,784

CLOSED LOOP WATER TREATING SYSTEM

Walter W. De Loach, 818 Cattlemen Rd., Sarasota, Fla. 33582

Filed Sep. 19, 1983, Ser. No. 533,216
Int. Cl.³ B01D *19/00, 53/14*
U.S. Cl. 55—196 **3 Claims**



1. A raw water treating system comprising in combination:

(a) a first chamber formed by a first envelope having a top and a bottom;

(b) a first frame structure disposed within said envelop;

(c) a plurality of slat trays supported by said first frame structure and disposed in spaced apart vertical orientation within said first envelope;

(d) a raw water inlet conduit mounted to said first envelope adjacent the top thereof and fluidly communicating with said first chamber, said conduit having a plurality of spray heads mounted thereto within said envelope;

(e) a gas inlet conduit mounted to said first envelope adjacent the bottom thereof;

(f) a product water conduit mounted to said bottom and protruding thereabove;

(g) an air resistor mounted to said bottom within said envelope and surrounding said product water conduit;

(h) a demister mounted to said top and disposed outside of said first envelope and fluidly communicating with said first chamber;

(i) a second chamber formed by a second envelope having a top and a bottom;

(j) a second frame structure disposed within said second envelope;

(k) a plurality of slat trays supported by said second frame structure and disposed in spaced apart vertical orientation;

(l) a gas inlet conduit mounted to said top and fluidly communicating with said second chamber;

(m) a wash header conduit disposed in said second chamber beneath said top and above said slat trays;

(n) collecting means mounted within said second envelope beneath said slat trays for receiving precipitate material;

(o) means for removing precipitate material from said collecting means;

(p) shroud means above said collecting means and beneath said slat trays for preventing said precipitate material from entering a plurality of

(g) air relief ports disposed beneath said shroud means, said ports being so constructed and arranged that gaseous fluid is carried from beneath said shroud to a zone beneath said collector;

(r) conduit means for carrying iron salt solution to said wash header;

(s) pump means for moving said iron solution in said conduit means;

(t) means within said second chamber for determing when more iron salt solution is needed in said conduit means;

(u) means for removing gaseous fluid from the bottom zone of said second chamber;

(v) means for dewatering said gaseous fluid before it is removed from said second chamber;

(w) means for conducting said gaseous fluid into said first chamber; and

(x) means for conducting gas from said demister into a top zone of said second chamber.

4,512,785

APPARATUS FOR DRYING STEAM IN STEAM POWER GENERATING STATIONS

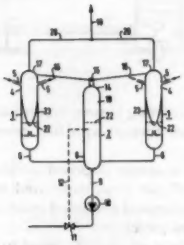
Georg Lösel, Uttenreuth, and Egon Schneider, Grossenseebach, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,209

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211784

Int. Cl.³ B01D *53/24*

U.S. Cl. 55—204 **7 Claims**



1. Apparatus for drying steam in steam power generating stations, comprising a plurality of cyclone separators having upper regions and lower ends, substantially tangential feed lines for a water-steam mixture leading to said upper regions of said cyclone separators, a water tank having an upper region and a lower end, respective discharge lines connected from said lower ends of said cyclone separators to said water tank, a water drain line connected to said lower end of said water tank, and a plurality of upwardly extending equalizing lines respectively connected at a lower end thereof to highest points of said upper regions of said water tank, each of said equalizing lines being connected at an upper end thereof to the upper region of a different one of said cyclone separators above said feed lines thereof.

4,512,786

EXHAUST GAS PURIFYING DEVICE

Shigeru Sakurai, and Shigeki Hamada, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 20, 1983, Ser. No. 486,819

Claims priority, application Japan, Apr. 21, 1982, 57-58746[U]; Apr. 24, 1982, 57-60148[U]

Int. Cl.³ B01D *39/20, 46/24, 46/42*

U.S. Cl. 55—282 **3 Claims**

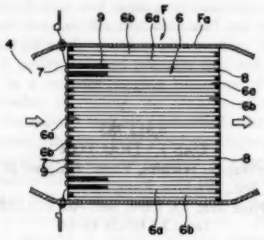
1. An exhaust gas purifying device comprising a housing having an inlet end, an outlet end and a generally elongated filter block disposed therebetween for use with a diesel engine having an exhaust passage for the discharge of exhaust gases from the engine to the atmosphere;

wherein said filter block has parallel channels defined therein so as to extend in a direction longitudinally of the filter block, said parallel channels being separated from one another by gas-permeable partition walls and having respective inlet ends for the introduction of exhaust gases thereinto and outlet ends for the discharge of exhaust gases therefrom;

a plurality of first blind plugs provided separate from the filter block and closing the inlet ends of some of the channels;

a plurality of second blind plugs closing the outlet ends of the other channels; and

an electric heating means comprised of at least one continuous heating wire having a plurality of generally U-shaped



wire portions which are electrically connected in series with each other, said U-shaped wire portions being inserted into the inlet ends of said some of the channels and supported by the respective first blind plugs, said U-shaped wire portions, when the heating wire is electrically energized, incinerating the exhaust gas particulates collected in the filter block.

4,512,787

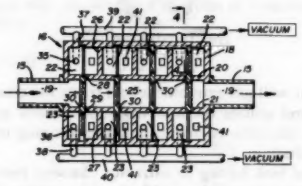
DEVICE FOR FILTERING STACK GASES

J. Paul Mathews, 7960 Market St., Youngstown, Ohio 44512

Filed Oct. 19, 1983, Ser. No. 543,486

Int. Cl.³ B01D *46/10*

U.S. Cl. 55—284 **6 Claims**

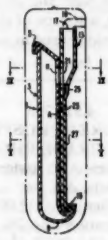


1. A device for filtering particulates from flue gases comprising a housing having top, bottom, side and end walls, said end walls having openings therein, first partitions in said housing defining a flue gas passageway therethrough communicating with said openings in said end walls, secondary partitions in said housing at right angles to said first partitions defining a plurality of chambers, said first partitions having slot-like openings therein communicating with each of said plurality of chambers, a plurality of panels slidably positioned in said slot-like openings for movement transversely of said first partitions and said flue gas passageway defined thereby, a plurality of filter elements positioned in side by side pairs in each of said plurality of panels, said chambers positioned to receive portions of said panels and one of each of said pairs of filter elements therein with the other one of each of said pairs of filter elements being in said flue gas passageway, said chambers having openings therein, means including vacuum conduits in communication with said openings for generating a substantial reverse air flow through each of said chambers and the filter elements therein so as to remove particulates from said filter elements, valves positioned and arranged in said vacuum conduits for allowing said reverse air flow through said chambers and said filter elements therein, said valves connected to said panels so as to be moved thereby.

4,512,788
TOP LOADING UPRIGHT VACUUM CLEANER BAG AND METHOD OF MANUFACTURING THE SAME

Raymond P. Weinstein, Raleigh, N.C., assignor to Home Care Industries, Inc., Oxford, N.C.

Filed Sep. 6, 1983, Ser. No. 529,568
Int. Cl.³ B01D 46/02
U.S. Cl. 55—374 19 Claims

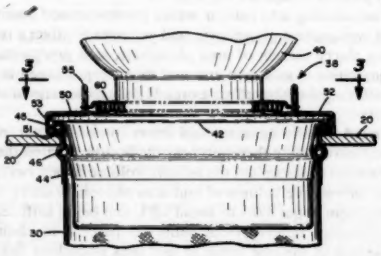


1. In a vacuum cleaner bag having a first collection tube of air pervious filter material having a closed top and a closed bottom and an aperture through one wall near the top thereof, and a second transfer tube having an open top and a narrower width than the first collection tube and an aperture in a wall thereof which cooperates with the aperture in the first collection tube, said first and second tubes adhesively secured together about the cooperating apertures, with the second transfer tube extending below said cooperating apertures, wherein said vacuum cleaner bag is for use with a top loading upright vacuum cleaner; the improvement wherein said second transfer tube has a thermoplastic coating within said tube around the inner walls thereof at least at the portion thereof adjacent the lower edge of the aperture therein and extending across said second transfer tube, and the inner walls of the second transfer tube are sealed together by fusion of said thermoplastic material at a location adjacent the lower edge of said aperture.

4,512,789
FILTER BAG CLAMP

Douglas L. Pettit, Owatonna, and Calvin E. Piilola, Minneapolis, both of Minn., assignors to General Resource Corporation, Minneapolis, Minn.

Filed Jan. 9, 1984, Ser. No. 569,039
Int. Cl.³ B01D 46/02
U.S. Cl. 55—378 7 Claims



1. An apparatus for securing a filter bag in suspension in a bag housing through an opening in a baffle plate, comprising

(a) a cover plate having a bottom downwardly projecting cylindrical section and having a top upwardly projecting mouth;

(b) at least one resilient O-ring fitted over said cylindrical section and adapted for constraining said bag against said cylindrical section;

(c) a first U-shaped clamp fitted over an edge of said cover plate, said first clamp having a lower leg for constraining a bag and said at least one O-ring against said cover plate and having an upper leg extending along the top of said cover plate, said upper leg having means for attachment of a spring thereto;

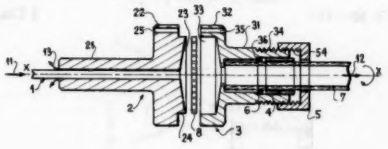
(d) a second U-shaped clamp fitted over an edge of said cover plate at a position opposite said projecting mouth relative to said first clamp, said second clamp having a lower leg for constraining a bag and said at least one O-ring against said cover plate and having an upper leg extending along the top of said cover plate, said upper leg of said second clamp having means for attachment of a spring thereto; and

(a) at least one tension spring attached between said first clamp and said second clamp.

4,512,790
ROTARY SEALING DEVICE

Michel Faure; Jean Y. Regeffe; Yves Lumineau, and André Jouanin, all of Conflans-Ste-Honorine, France, assignors to Lignes Telegraphiques & Telephoniques, Honorine, France

Filed Apr. 16, 1982, Ser. No. 369,275
Claims priority, application France, Apr. 21, 1981, 81 07914
Int. Cl.³ C03B 37/07
U.S. Cl. 65—13 9 Claims



1. A rotary sealing device connecting a stationary gas supply pipe to a rotary tube means for rotating about its axis, comprising a first rotary means for slidably receiving said pipe and having a means defining a first opening for communicating with said pipe, a second rotary means for receiving and sealing said rotary tube means, said second rotary means being fixed to said first rotary means, and a third means clamped between said first and second rotary means for creating an overpressure within the first rotary means in which penetration of vapor from outside said device into said first opening and towards said second rotary means is opposed.

4,512,791
HERMETICALLY SEALED INSULATING ASSEMBLY

James C. Kyle, 2547 Fisher Rd., Roseburg, Oreg. 97470

Division of Ser. No. 322,014, Nov. 16, 1981, Pat. No. 4,461,926, which is a continuation of Ser. No. 111,787, Jan. 9, 1980, abandoned. This application May 2, 1984, Ser. No. 606,410
Int. Cl.³ C03C 27/02, 3/22; H01B 17/26
U.S. Cl. 65—21.1 5 Claims

1. A method of hermetically sealing first and second spaced members, including the steps of

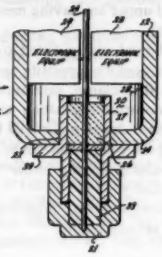
providing a mixture of the oxides of lead, zinc, aluminum, silicon, cerium, lanthanum, cobalt, sodium, zirconium, bismuth and molybdenum,

heating the mixture to a temperature of at least 2000° F. for several hours,

quenching the mixture in water,

forming particles of the quenched mixture into beads,

disposing the beads in the space between the first and second spaced members,



heating the assembly for a limited period of time at an elevated temperature in the order of 1900° F., and

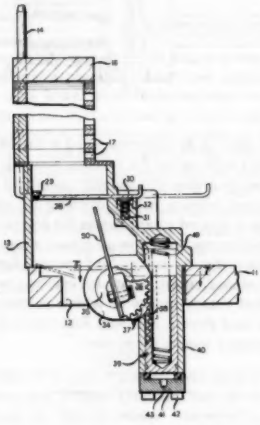
then quenching the assembly.

4,512,792

COOLING WIND SHUT-OFF VALVE FOR GLASS FORMING MOLD

George W. Irwin, Holland, Ohio, and Eustace H. Mumford, Ottawa, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 11, 1983, Ser. No. 512,265
Int. Cl.³ C03B *11/12*
U.S. Cl. 65—161 **6 Claims**



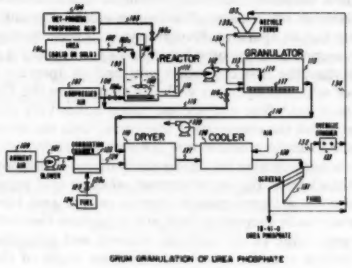
1. In a glass forming machine of the plural individual section type where a plurality of charges of molten glass are simultaneously formed in molds at a forming station and in a timed sequence other charges are formed in other forming stations with cooling air being supplied to the hollow base of each machine section, the improvement in the application of cooling air to the molds at the forming stations comprising, an elongated, hollow, generally horizontal, wind nozzle base mounted beside each of the sets of molds at the forming stations, said nozzle base overlying an opening in said machine base, said wind nozzle base comprising a casting having a pair of vertical cylinders formed therewith, said casting being positioned at the adjacent edges of two forming machine sections such that it is positioned between the molds on adjacent sections, each said cylinder constituting a vertical, fluid motor extending through an opening in a respective machine section base, wind directing nozzles on said nozzle base for receiving compressed cooling air from said base, a damper plate extending through a horizontal slot in the side of said wind nozzle base, said plate being manually movable relative to said base for regulating the flow volume of air from said base, means yieldably engaging said plate for maintaining said plate in its adjusted position, a fluid pressure operated rack in said motor, a gear sector mounted for rotation about a horizontal axis, said gear sector being in mesh with said rack, a vane mounted to said gear sector, said vane being of a size sufficient to close the air opening between the machine base and the nozzle base when rotated by said fluid motor, a source of fluid under pressure and a means for connecting said source to said motor for operating said motor.

4,512,793

GRANULATION OF UREA PHOSPHATE FROM UREA AND MERCHANT-GRADE PHOSPHORIC ACID

Cecil P. Harrison, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 322,096, Nov. 16, 1981, Pat. No. T102,201. This application Apr. 30, 1984, Ser. No. 605,345
Int. Cl.³ C05B *15/00*
U.S. Cl. 71—29 **8 Claims**



GRUM GRANULATION OF UREA PHOSPHATE

1. A process for the direct production, from wet-process phosphoric acid containing the congeneric impurities thereof therein and urea, of granular urea phosphate fertilizers having a predetermined closely controlled particle size range and excellent handling characteristics including relatively high granular crushing strength, said granular urea phosphate being eminently suitable, either alone or in homogeneous admixture with urea, for soil surface application agronomic particles, which process comprises the steps of:

(1) introducing into reactor means predetermined quantities of wet-process phosphoric acid and urea to effect a resulting slurry therein of urea phosphate, said predetermined quantities of said acid and said urea proportioned in said resulting slurry to effect a urea:H_3PO_4 mole ratio of about 1:1;

(2) mechanically agitating said slurry in said reactor means and introducing thereinto near the bottom portion thereof a stream of sweep air, the relative volume of said sweep air to the relative volume of said urea phosphate slurry ranging from about 4.0:1 to about 10:1, and being sufficient to physically remove from about 50 percent to about 70 percent of the free water in said urea phosphate slurry;

(3) subsequently removing from said reactor means at least a portion of the resulting dehydrated urea phosphate slurry material and introducing same into granulator means, together with recycled fines from a later-mentioned sizing step and predetermined quantities of additional sweep air introduced beneath the resulting granulation bed in said granulator means, said additional sweep air being in volumetric proportions to said granules in said granulator means ranging from about 10:1 to about 20:1 and being sufficient to remove substantially all of the remaining free

moisture in said urea phosphate slurry introduced thereinto; and

(4) removing at least a portion of essentially dry granular urea phosphate product from said granulator means and introducing same into drying, cooling, and sizing means wherefrom product size material is obtained and undersize as well as crushed initially oversize material is recycled to said granulator means;

said process characterized by the fact that at least about 99 percent of the free water present in said urea phosphate slurry formed in said reactor means is removed physically via sweep air introduced into both said reactor means and said granulator means and substantially no external heat energy is expended therein for such purposes.

4,512,794

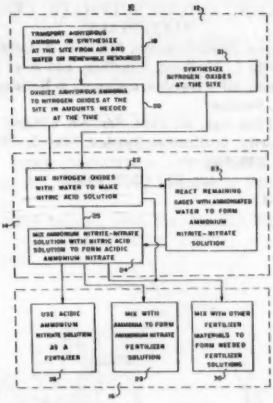
MANUFACTURING AND USING NITROGEN FERTILIZER SOLUTIONS ON A FARM

John A. Eastin, P.O. Box 389, Lincoln, Nebr. 69140

Division of Ser. No. 379,551, May 18, 1982, Pat. No. 4,427,434, which is a continuation-in-part of Ser. No. 100,825, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 824,289, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 728,788, Oct. 1, 1976, abandoned, which is a division of Ser. No. 581,050, May 27, 1975, abandoned. This application Jun. 23, 1983, Ser. No. 507,721

Int. Cl.³ C05C *7/00, 3/00*

U.S. Cl. 71—54 **25 Claims**


TRANSPORT ANHYDROUS AMMONIA OR SYNTHESIZE AT THE SITE FROM AIR AND WATER OR RENEWABLE RESOURCES
SYNTHESIZE NITROGEN OXIDES AT THE SITE
OXIDIZE ANHYDROUS AMMONIA TO NITROGEN OXIDES AT THE SITE IN AMOUNTS NEEDED AT THE TIME
MIX NITROGEN OXIDES WITH WATER TO MAKE NITRIC ACID SOLUTION
REACT REMAINING GASES WITH AMMONIATED WATER TO FORM AMMONIUM NITRITE–NITRATE SOLUTION
MIX AMMONIUM NITRITE–NITRATE SOLUTION WITH NITRIC ACID SOLUTION TO FORM ACIDIC AMMONIUM NITRATE
USE ACIDIC AMMONIUM NITRATE SOLUTION AS A FERTILIZER
MIX WITH AMMONIA TO FORM AMMONIUM NITRATE FERTILIZER SOLUTION
MIX WITH OTHER FERTILIZER MATERIALS TO FORM MIXED FERTILIZER SOLUTIONS

1. A process of making nitrogen solutions from ammonia comprising the steps of:

oxidizing ammonia in air at a rate of less than 146 pounds of nitrogen per hour at a concentration of between 10% and 25% by volume of ammonia to air and at a temperature of between 1,000 and 2,000 degrees Fahrenheit in a continuous process at a pressure between atmospheric pressure and a vacuum pressure of ¼ of an atmosphere to form a continuous stream of nitrogen oxides whereby the ammonia is oxidized at a rate sufficiently slow to permit cooling by air circulation and single-pass water flow of less than 12 gallons per minute permitting the oxidation to proceed until at least equivalent quantities of nitrogen dioxide and nitric oxide are obtained;

mixing the nitrogen oxides with water at a rate of less than 12 gallons per minute to form nitric acid and nitric oxide by reaction of at least a portion of the nitrogen dioxide and water as the nitrogen oxides are formed;

flowing substantially all of the remaining nitrogen oxides and substantially all of the nitric oxide formed by the reaction of nitrogen dioxide with water to a reactor;

reacting the nitrogen oxides in the reactor with ammonium hydroxide in a continuous process at a pressure between atmospheric pressure and a vacuum pressure of ¼ of an atmosphere in a stream flowing in the range of less than 0.5 gallon each minute of ammoniated water per square foot of reactor cross section sufficiently ammoniated to provide a pH in the range of 8.0 to 8.4 passing through a mixture of nitrogen oxides in which the ratio of nitric oxide to nitrogen dioxide is greater than one to form an ammonium nitrate liquid solution at a pH above 6.7; and

combining the nitric acid and the ammonium nitrite at a pH of less than 2 to form ammonium nitrate, nitrogen dioxide and water, whereby a liquid is formed which includes ammonium nitrate.

4,512,795

NORBORNANE COMPOUNDS, PLANT GROWTH REGULATORS CONTAINING THESE COMPOUNDS, AND THEIR INTERMEDIATES

Norbert Rieber; Rolf Platz, both of Mannheim, and Johann Jung, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

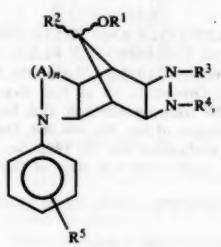
Filed Jan. 11, 1983, Ser. No. 457,172

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201190; Mar. 6, 1982, 3208090; Mar. 6, 1982, 3208091

Int. Cl.³ A01N *43/62, 43/64;* C07D *229/02, 249/16*

U.S. Cl. 71—88 **3 Claims**

1. A norbornane compound of the formula



II

where A is —N=N—, n is 0 or 1, R^1 is hydrogen, trimethylsilyl or trifluoroacetyl, or an acyclic or cyclic alkyl or alkylcarbonyl radical wherein each of the alkyl substituents contain from 1 to 5 carbon atoms, or R^1 and R^2 together constitute a bond, the steric arrangement of substituents OR^1 and R^2 at the C_1 bridge not being defined, and R^3 and R^4 are independently hydrogen or a C_1–C_4 alkyoxycarbonyl, or together constitute a bond, and R^5 is hydrogen, a halogen or C_1–C_4 haloalkyl wherein in each instance the halogen substituent is selected from the group consisting of fluorine, bromine and chlorine.

4,512,796

HALOACETYLAMINOMETHYL DIOXOLANE HERBICIDE ANTIDOTES

Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

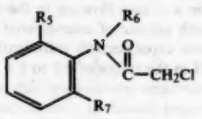
Division of Ser. No. 286,328, Jul. 24, 1981, Pat. No. 4,406,686. This application May 25, 1983, Ser. No. 497,943

Int. Cl.³ A01N *43/28*

U.S. Cl. 71—88 **10 Claims**

1. A herbicidal composition comprising:

(a) an herbicidally effective amount of an acetanilide compound of the formula

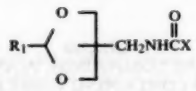


in which

R_5 and R_7 are independently each alkyl having 1–2 carbon atoms, inclusive; and

R_6 is alkoxyalkyl having 1–4 carbon atoms, inclusive; and

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



in which

X is halomethyl, wherein halo is selected from the group consisting of chlorine, bromine, and iodine and the methyl group is mono-, di-, or tri-substituted; and

R_1 is selected from the group consisting of lower alkyl having 1–4 carbon atoms, inclusive, and alkenyloxy having from 2–6 carbon atoms, inclusive, provided that, if R_1 is alkyl the haloacetylaminomethyl moiety is attached to the ring at the 2-position.

4,512,797

1,3,5-TRIAZINONES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Adolf Parg, Bad Durkheim; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

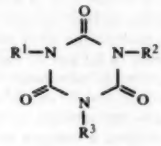
Continuation-in-part of Ser. No. 446,064, Dec. 1, 1982, abandoned. This application Jan. 28, 1983, Ser. No. 462,024

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147879

Int. Cl.³ C07D *251/34;* A01N *43/64*

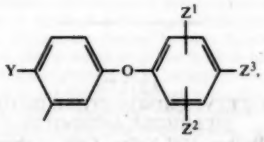
U.S. Cl. 71—93 **8 Claims**

1. A 1,3,5-triazinone of the formula



(I)

where R^1 is



where Z^1 and Z^2 independently of one another are each hydrogen, halogen, nitro, cyano or carboxyl, or alkyl, haloalkyl or alkoxy, each of not more than 4 carbon atoms, Z^3 is halogen, nitro or cyano, or alkyl, haloalkyl, alkoxy, haloalkoxy, alkylmercapto, alkylsulfinyl, or alkylsulfonyl, each of not more than 4 carbon atoms, and Y is hydrogen, halogen, cyano or nitro, and R^2 is hydrogen or a saturated or unsaturated, straight-chain or branched aliphatic radical of not more than 20 carbon atoms, or R^2 is a saturated, straight-chain or branched aliphatic radical of not more than 10 carbon atoms which is substituted by halogen, cyano, hydroxyl or mercapto, or by alkoxy or alkylmercapto, each of not more than 4 carbon atoms, or by phenylmercapto, or by alkylamino or dialkylamino, where each alkyl is of 1 to 4 carbon atoms, or R^2 is cycloalkyl of 3 to 7 carbon atoms which is unsubstituted or substituted by alkoxy of 1 to 4 carbon atoms, or R^2 is phenyl which is unsubstituted or substituted by halogen, or by alkyl or alkoxy, each of 1 to 4 carbon atoms, or by nitro or cyano, or by haloalkyl, haloalkoxy or haloalkylmercapto, each of 1 to 4 carbon atoms, or R^2 is benzyl or halobenzyl, and R^3 is hydrogen, alkyl of not more than 4 carbon atoms or acyl of not more than 7 carbon atoms which is unsubstituted or substituted by halogen, or is an alkali metal ion or an ammonium ion or an alkylated ammonium ion.

8. A process for controlling unwanted plant growth, wherein the unwanted plants and/or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a 1,3,5-triazinone of the formula I as claimed in claim 1.

4,512,798

METHOD FOR PRODUCING LEAD FROM SULPHIDIC AND OXIDIC AND/OR SULPHATIC LEAD RAW MATERIALS

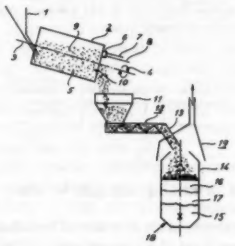
Johan S. Leirnes, Skelleftehamn; Malkolm S. Lundström, Skellefteå; Martin L. Hedlund, Ursviken, and Kurt J. A. Burén, Skelleftehamn, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Apr. 30, 1984, Ser. No. 605,665

Claims priority, application Sweden, May 5, 1983, 8302584; May 5, 1983, 8302585

Int. Cl.³ C22B *13/02*

U.S. Cl. 75—3 **11 Claims**



1. A method for producing lead from moist lead sulphide concentrates and at least one of oxidic lead raw material and sulphatic lead raw material comprising:

(a) introducing granules or pellets of at least one of oxidic lead raw material and sulphatic lead raw material with the moist lead sulphide concentrate into a drum-like vessel adapted for rotation about its longitudinal axis;

(b) drying the moist lead sulphide concentrate while rotating the vessel thereby forming dried sulphide-containing granulates;

(c) heating said dried sulphide-containing granulates with a flux in a furnace to form a melt composed of a lead-containing liquid slag phase and a molten lead phase;

(d) agitating the melt;

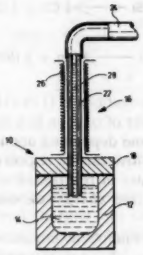
(e) adding a reducing agent to decrease the lead content of the liquid slag; and

(f) recovering the molten lead phase.

4,512,799
VACUUM TREATING STEELS

Joseph A. Mulcahy, Brooklin, Canada, assignor to J. Mulcahy Enterprises Incorporated, Whitby, Canada

Filed Jan. 30, 1984, Ser. No. 575,202
Int. Cl.³ C21C 7/10
U.S. Cl. 75—49 10 Claims



1. A method for the vacuum treating of molten metals, which comprises:

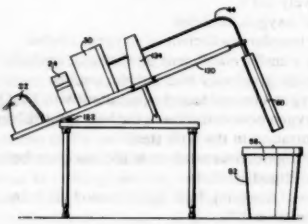
applying vacuum to a tube dipping into a molten bath of an electroconductive metal to draw said molten metal into said tube and to form an elongate rod of said molten metal within said tube, and

electromagnetically radially-inwardly compressing the elongate rod, so as to detach said elongate rod from the internal wall of said tube and to expose the external surface of the electromagnetically-compressed rod to said vacuum, thereby to withdraw dissolved gases from said molten metal rod.

4,512,800
WIRE INJECTION APPARATUS

Emil J. Wirth, Jr., Yardley, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 12, 1983, Ser. No. 522,753
Int. Cl.³ C21C 7/00
U.S. Cl. 75—53 24 Claims



1. An apparatus for injecting a processing element in the form of a wire below the surface of a molten material, comprising:

a heat resistant nozzle, movable into an operative position wherein an inlet is disposed above said surface and an outlet is disposed below said surface, with said nozzle being provided with a bore having a funnel-shaped section terminating at its narrower end in a substantially circular aperture and a substantially cylindrical section of substantially uniform diameter into which said aperture opens, said funnel-shaped and substantially uniform diameter sections being concentric, said substantially uniform diameter being larger than the diameter of said aperture and the axial length of said uniform diameter section comprising only a minor portion of the axial length of the nozzle, and with the opening at the end of said substantially uniform diameter section opposite said aperture forming the outlet of the nozzle;

a gas-tight conduit connected at one end to the nozzle inlet;

means disposed at the other end of the conduit for sealably receiving the wire;

means for injecting an inert gas into the conduit; and

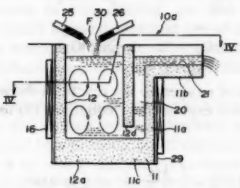
means for feeding the wire into and through the conduit and nozzle and directly into the interior of the molten material,

whereby the injected wire is centered in said nozzle outlet and inert gas leaving the nozzle outlet together with the wire substantially prevents closure of the outlet by solidified molten material and facilitates mixture of the processing element into the molten material through gas bubble agitation.

4,512,801
APPARATUS FOR AND METHOD OF DESULFURIZING AND HEATING MOLTEN METAL

Shigeyuki Shigihara, and Masahiro Tadokoro, both of Ise, Japan, assignors to Shinko Electric Co. Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,650
Claims priority, application Japan, Dec. 21, 1982, 57-224666; Dec. 21, 1982, 57-224667
Int. Cl.³ C21C 7/02
U.S. Cl. 75—58 3 Claims



1. Apparatus for desulfurizing and heating molten metal which comprises:

a. a body of a refractory material including an open top receptacle, an outlet, and a passageway extending upwardly from said receptacle at a bottom thereof to said outlet for communicating said receptacle with said outlet;

b. an electric coil disposed in surrounding relation to said receptacle, the upper end of said coil being disposed generally equal to the level of said outlet, so that the level of the molten metal in said receptacle is generally equal to the upper end of said coil;

c. a first feed means for supplying molten metal to said receptacle through said open top; and

a second feed means for supplying a desulfurizing agent to said receptacle through said open top;

e. whereby upon excitation of said coil, electric currents are induced in said molten metal to heat it and also to agitate it to mix said desulfurizing agent with said molten metal.

4,512,802
PROCESS FOR THE DECARBURIZATION OF MOLTEN METAL

Takeya Tohge, Yokohama, Japan, assignor to Nippon Yakin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,001
Int. Cl.³ C21C 5/32
U.S. Cl. 75—60 3 Claims

1. A process which controls decarburization of a predetermined mass of molten metal comprising carbon and iron, said mass being contained within a refractory lined vessel having means for injecting oxygen and a diluting gas therein, and adjustable gas flow control means for varying the flow rate of the respective gases; said process comprising:

(a) setting said adjustable control means to establish a first

flow rate greater than zero for said oxygen and a first flow rate for said diluting gas;

(b) utilizing a computer to carry out the following sequence of steps:

(1) calculating amount of oxidization of metal using values obtained from following calculations:

(1-1) calculating amounts of carbon, silicon and manganese oxidized per unit time from product of concentration difference of each element between reaction interface and bulk metal by a vessel factor calculated from an actual data measured and a result calculated using a Model I, said Model I comprising:

(1) Oxygen-argon mixed refining gas injected into a refining vessel through plural tuyeres becomes bubbly, and as soon as oxygen gas comes into reaction with carbon, silicon, manganese and chromium in molten metal, CO, SiO_2, MnO and Cr_2O_3 are formed;

reactions in the vicinity of said tuyeres are shown by equations (1) to (4);

$$O_2 + 2C \longrightarrow 2CO \quad (1)$$

$$O_2 + 4/3Cr \longrightarrow \tfrac{2}{3}(Cr_2O_3) \quad (2)$$

$$O_2 + 2Mn \longrightarrow 2(MnO) \quad (3)$$

$$O_2 + Si \longrightarrow (SiO_2) \quad (4)$$

distributions of oxygen to the reactions shown by equations (1) to (4) are expressed by equations (5) to (8)

$$O_2(C) = \left(\frac{\frac{1}{2}J_C}{\Sigma J_j}\right) \cdot \dot{n}_{O_2}, \text{ mol/sec} \quad (5)$$

$$O_2(Cr) = \left(\frac{\frac{2}{3}J_{Cr}}{\Sigma J_j}\right) \cdot \dot{n}_{O_2}, \text{ mol/sec} \quad (6)$$

$$O_2(Mn) = \left(\frac{\frac{1}{2}J_{Mn}}{\Sigma J_j}\right) \cdot \dot{n}_{O_2}, \text{ mol/sec} \quad (7)$$

$$O_2(Si) = \left(\frac{J_{Si}}{\Sigma J_j}\right) \cdot \dot{n}_{O_2}, \text{ mol/sec} \quad (8)$$

and further the flux J_j to the interface from the bulk metal are shown in equations (9) and (10);

$$J_j = \frac{\rho_m}{100\,M_j} \cdot k_j \cdot A_B \cdot (\%\,C_{bj} - \%\,C_{ij}), \text{ mol/sec} \quad (9)$$

$$\Sigma J_j = \tfrac{1}{2} J_C + \tfrac{2}{3} J_{Cr} + \tfrac{1}{2} J_{Mn} + J_{Si}, \text{ mol/sec} \quad (10)$$

where:

j: any one selected from C,Si,Mn and Cr.

$\%C_{bj}$: bulk concentration of j

$\%C_{ij}$: concentration j at the interface

$\dot{n}_{O_2}$: amount of oxygen injected into vessel, mol/sec

ρ_m: density of liquid steel, g/cm^3

k_j: mass transfer coefficient of j, cm/sec

A_B: the surface of bubbles, cm^2/sec

(2) Cr_2O_3 and MnO formed in equations (2) and (3) ascend with bubbles in the molten metal, and in said ascending process are shown in equations (11)–(14), said Cr_2O_3 and MnO are reduced by carbon and silicon in molten metal (hereinafter said carbon and silicon are written as C and Si respectively);

$$\tfrac{2}{3}(Cr_2O_3) + C \longrightarrow \tfrac{4}{3} Cr + CO \quad (11)$$

$$(MnO) + C \longrightarrow Mn + CO \quad (12)$$

$$\tfrac{2}{3}(Cr_2O_3) + \tfrac{4}{3} Si \longrightarrow \tfrac{4}{3} Cr + \tfrac{4}{3}(SiO_2) \quad (13)$$

$$(MnO) + \tfrac{1}{2} Si \longrightarrow Mn + \tfrac{1}{2}(SiO_2) \quad (14)$$

rates of reaction in equations (11) to (14) depending upon a rate of mass transfer of oxygen in a high carbon region of the molten metal and depending upon a rate of mass transfer of carbon in a low carbon region of the molten metal, and further the rates of reaction in equations (11) to (14) depending upon free energy of said equations respectively;

changes of carbon monoxide concentration d(CO)/dx in ascending bubbles, changes of concentrations of chromium, manganese and silicon d(Cr)/dx, d(Mn)/dx, d(Si)/dx contained in respective oxides remained in bubbles and changes of nitrogen concentration in bubbles being indicated in equations (15) to (19);

$$\frac{d(CO)}{dx} = \frac{j_o}{V_B} \cdot \frac{\Delta G_{11} + \Delta G_{12}}{\Delta G_T}, \text{ mol cm} \quad (15)$$

$$\frac{d(Cr)}{dx} = -\frac{j_o}{V_B} \cdot \frac{\Delta G_{11} + \Delta G_{13}}{\Delta G}, \text{ mol/cm} \quad (16)$$

$$\frac{d(Mn)}{dx} = -\frac{j_o}{V_B} \cdot \frac{\Delta G_{12} + \Delta G_{14}}{\Delta G_T}, \text{ mol/cm} \quad (17)$$

$$\frac{d(Si)}{dx} = -\frac{j_o}{V_B} \cdot \frac{\Delta G_{13} + \Delta G_{14}}{G_T}, \text{ mol/cm} \quad (18)$$

$$\frac{d(N_2)}{dx} = \frac{\rho_m}{2800} \cdot \frac{A_B}{V_B} \cdot k_N(\%\,Nb - \%\,N,i), \text{ mol/cm} \quad (19)$$

where:

$\Delta G_{11,12,13,14}$: free energy of equation (11),(12),(13),(14) respectively cal

j_o: flux of oxygen, mol/sec

k_o: mass transfer coefficient of oxygen, cm/sec

k_N: mass transfer coefficient of nitrogen, cm/sec

V_B: ascending velocity of a bubble, cm/sec

%Oi: oxygen concentration equibrated with Cr_2O_3

%Ob: oxygen concentration in the bulk steel %Nb: nitrogen concentration in the bulk steel

%N,i: nitrogen concentration at the interface between bubble and liquid steel;

the flux of oxygen j_o from interface to bulk being indicated in equation (20);

$$j_o = \frac{\rho_m}{1600} \cdot AB \cdot k_o\,(\%\,Oi - \%\,Ob), \text{ mol/sec} \quad (20)$$

(3) material balance of the molten steel and the slag being calculated as follows; change of weight of the molten metal dWm/dt is indicated in equation (21) and change of composition of the molten metal d%/dt is indicated in equations (22) and (23);

$$\frac{dWm}{dt} = -\{\Sigma\,\Delta\,Ci \cdot Mi\} - \sum_j \frac{dW_{SC,1}}{dt}, \text{ g/sec} \quad (21)$$

$$\frac{d[\%\,Ci]}{dt} = \frac{100\,Mi}{Wm} \cdot \Delta\,Ci - \frac{\%\,Ci}{Wm} \cdot \frac{dWm}{dt} - \quad (22)$$

-continued

$$\Sigma \frac{\%\ Ci,1}{Wm} \cdot \frac{dW_{SC,1}}{dt},\ \%/\text{sec}$$

where

i: C,Si,Mn,Ni,Cr respectively

$$\frac{d[\%\ N]}{dt} = -\frac{2800}{Wm} \cdot \Delta N_2 - \frac{[\%\ N]}{Wm} \cdot \frac{dW_m}{dt} + \frac{\rho_m \cdot k'_N \cdot A}{Wm} (\%\ N' - \%\ Nb),\ \%/\text{sec} \quad (23)$$

where

ΔCi: amount of oxidation of i, mol/sec

Mi: atomic weight of i, g/mol

1: kinds of scrap charged into vessel

W_{SC}: weight of scrap charged into vessel, g

ΔN_2: amount of denitrization in bubble, mol/sec

ρ_m: density of molten metal, g/cm^3

k'_N: mass transfer coefficient of nitrogen in the molten metal at free surface, cm/sec

N': nitrogen concentration at free surface, %

A: area of free surface, cm^2

change of weight of molten slag dWs/dt and change of composition of molten slag

$$\frac{d[\%\ M_XO_Y]}{dt}$$

are indicated in equations (24) and (25) respectively.

$$\frac{dW_s}{dt} = \frac{M_{Cr_2O_3}}{2} \cdot \Delta Cr + M_{MnO} \cdot \Delta Mn + M_{SiO_2} \cdot \Delta Si + M_{FeO} \cdot \Delta Fe - \frac{dW_{CaO}}{dt},\ \text{g/sec} \quad (24)$$

$$\frac{d[\%\ M_XO_Y]}{dt} = \frac{100\ M_{MxOy}}{W_s} \cdot \Delta C_{MxOy} - \frac{\%\ MxOy}{Ws} \cdot \frac{dWs}{dt},\ \%/\text{sec} \quad (25)$$

where

MxOy: Cr_2O_3,MnO,FeO,SiO_2

ΔCr: amount of Cr oxidized, mol/sec

ΔMn: amount of Mn oxidized, mol/sec

ΔSi: amount of Si oxidized, mol/sec

ΔFe: amount of Fe oxidized, mol/sec

(4) calculating heat balance from all heat of reaction produced in refining process, radiation loss through vessel mouth, heat loss through shell of vessel, heat of fusion of coolants and enthalpy of gas, and calculating change of temperature of molten metal from equation (26);

$$\frac{dT}{dt} = \Sigma\ Q/(C_{p,s}\ W_s + C_{p,m}\ W_m),\ ^\circ\text{C/sec} \quad (26)$$

where

$C_{p,s}$: specific heat of slag, cal/°C/g

$C_{p,m}$: specific heat of metal, cal/°C/g

ΣQ: sum of heat of reactions, heat losses from vessel and others, cal

(1-2) providing that remainders after substracting the amount of oxygen consumed in said oxidizing reactions of sub-step (1-1) from the amount of oxygen injected during said unit time is the amount of oxygen consumed for the oxidization of chromium;

(1-3) calculating the amount of iron oxidized by Cr_2O_3 using mole fraction ratio Cr/Fe in the slag which is obtained at an actual operation; said mole fraction ratio Cr/Fe being constant at any time in the reaction;

(2) calculating the amount of nitrogen absorbed per unit time in molten metal or removed per unit time from molten metal from product of concentration difference of nitrogen between reaction interface and bulk metal by the vessel factor obtained in (1-1);

(3) calculating change of temperature of the molten metal using values obtained from following calculations:

(3-1) calculating material balance from the amounts of oxidization of carbon, silicon, manganese, chromium and iron and from the amount of nitrogen absorbed in the molten metal or the amount of nitrogen removed from the molten metal, said amount being obtained by sub-steps (1) and (2);

(3-2) calculating change of weight of the molten steel, change of composition of the elements contained in the molten steel, change of weight of the molten slag and change of composition of the slag;

(3-3) calculating heat balance of the molten metal and the molten slag from heats of reaction at the oxidizing reaction, amount of heat loss out of said vessel and amount of heats of fusion of coolants;

(4) calculating weights, compositions and temperature of said molten metal and slag after predetermined time interval using said values of changes per unit time;

(c) changing the ratio of oxygen to a diluting gas to increase the proportion of said diluting gas and changing the amount of gases injected into said vessel at the point in time when amount of said decarburization calculated at sub-step (1) becomes less than a predetermined amount of decarburization;

(d) continuing blow of refining gas up to a time when carbon content in the molten metal calculated in sub-step (4) becomes equal to a predetermined carbon content;

(e) charging a necessary amount of coolants to lower the temperature of the molten metal down to a predetermined temperature range when temperature of the molten metal becomes equal to a predetermined maximum temperature.

4,512,803

PROCESS FOR RECOVERING LEAD FROM LEAD CHLORIDE CONTAINING RAW MATERIAL

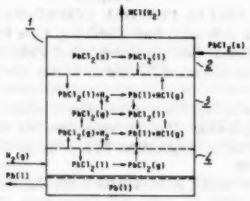
Erik G. Bäck, Helsingborg, and Björn-Eric Lundin, Huddinge, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Jan. 10, 1984, Ser. No. 569,657

Claims priority, application Sweden, Feb. 2, 1983, 8300536

Int. Cl.^{3} C22B *13/00*

U.S. Cl. 75—77 **16 Claims**



1. A method for recovering lead from lead chloride by reducing the lead chloride with a reducing gas in a reaction zone, said method comprising:

(a) introducing a major portion of the lead chloride in liquid or solid form into a lower part of the reaction zone;

(b) heating the lead chloride whereby a bath of liquid lead chloride is present and a portion of the liquid lead chloride is vaporized;

(c) introducing the reducing gas in a lower part of the reaction zone;

(d) contacting the liquid and vaporized lead chloride with the reducing gas whereby liquid lead chloride is reduced to liquid lead and vaporized lead chloride flows upward through the reaction zone with the remainder of the reducing gas and is reduced or condensed;

(e) introducing the remainder of the lead chloride into an upper part of the reaction zone thereby cooling said part of the reaction zone;

(f) contacting the lead chloride introduced into the upper part of the reaction zone with the upwardly flowing reducing gas;

(g) removing a gaseous effluent from the upper part of the reaction zone; and

(h) removing lead from the reaction zone, wherein the method is operated in the absence of an external recycle of liquid lead chloride and such that the upper part of the reaction zone is maintained at a lower temperature than the lower part of the reaction zone.

4,512,804

WORK-HARDENABLE AUSTENITIC MANGANESE STEEL AND METHOD FOR THE PRODUCTION THEREOF

Bernd Kos, Leoben, Austria, assignor to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Filed Mar. 30, 1983, Ser. No. 480,998

Claims priority, application Austria, Apr. 13, 1982, 1435/82

Int. Cl.³ C22C *38/38*

U.S. Cl. 75—123 N **16 Claims**

1. A work-hardenable austenitic manganese steel having an elongation at rupture of 10 percent to 80 percent, as measured according to L=5 d or L=10 d, and essentially consisting of, each in percent by weight:

0.7 to 1.7 C
5.0 to 18.0 Mn
0 to 3.0 Cr
0 to 4.0 Ni
0 to 2.5 Mo
0.1 to 0.9 Si
up to 0.1 P

with the proviso that the carbon-to manganese ratio is between 1:4 and 1:14, and containing an amount of micro-alloying elements in percent by weight:

0.0 to 0.05 Ti
0.0 to 0.05 Zr

with the proviso that the sum Ti + Zr is in the range of 0.002 percent by weight to 0.05 percent by weight, the remainder iron and impurities arising during the melting process.

4,512,805

VALVE METAL POWDER DOPED WITH BORON

Wolf-Wigand Albrecht, Bad Harzburg; Uwe Papp, Goslar, and Dieter Behrens, Bad Harzburg, all of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 416,194, Sep. 9, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 620,109

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140248

Int. Cl.³ C22C *1/08*; H01G *9/05*; B22F *1/00, 9/24*

U.S. Cl. 75—244 **18 Claims**

1. In a process for producing an agglomerated valve metal powder for use in electrolytic capacitors having a low relative leakage current and a high specific charge, wherein the valve metal powder is heated under vacuum or under inert gas until an agglomerated state of said valve metal powder is achieved, the improvement which comprises admixing boron or a boron compound in amount up to 0.5 percent by weight, relative to the metal content, with the valve metal powder before thus thermally agglomerating said powder.

3. In a process for producing a sintered valve metal anode which comprises forming a green valve metal anode with valve metal powder and sintering said green valve metal anode, the improvement which comprises adding a boron compound in liquid or gaseous phase to the green valve metal anode prior to or during sintering so that in the sintered final product boron of up to 0.5 percent by weight, relative to the metal content, is present in the metallic phase.

4. A sintered valve metal anode produced by the process of claim 3.

5. In a process for producing a doped valve metal powder for use in electrolytic capacitors having a low relative leakage current and a high specific charge, wherein a doping agent is added to raw material for producing the valve metal and said raw material is then processed to produce the valve metal in elemental and powdered form, the improvement which comprises during the production of said valve metal powder admixing boron or a boron compound as the doping agent with the raw material for producing said valve metal powder in an amount of up to 0.5 percent by weight relative to the total metal content of the resulting powder.

4,512,806

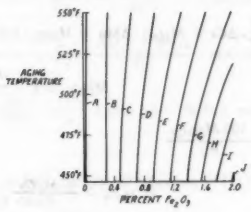
FLAME RESISTANT ASHALTIC COMPOSITIONS

Joseph Graham, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 206,275, Nov. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,614, Jul. 23, 1979, Pat. No. 4,234,639. This application Dec. 6, 1982, Ser. No. 446,880

Int. Cl.³ C09D *5/18*

U.S. Cl. 106—18.24 **20 Claims**



1. Composition comprising (a) 100 parts of asphalt, bitumen, or pitch; (b) 0.1 to 1 weight-part of a linear aliphatic saturated halogenated organic compound that (i) has a molecular weight of at least 300, (ii) includes halogen in an amount of at least 40 weight-percent, and (iii) decomposes to release halogen when heated by itself to a temperature greater than about 100° C. and when heated in the presence of an excess of iron oxide to a temperature less than about 250° C.; a and (c) at least 0.1 part of iron-containing compound adapted to react with said released halogen to form iron halide, whereby heating of the mixture causes catalysis of the asphalt, bitumen, or pitch to a more viscous state.

4,512,807

AQUEOUS INK COMPOSITION FOR INK-JET PRINTING

Akira Ogawa, and Toshiaki Asano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

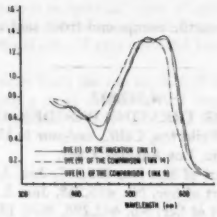
Filed Feb. 17, 1983, Ser. No. 467,671

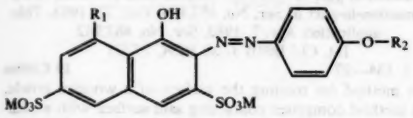
Claims priority, application Japan, Feb. 17, 1982, 57-24219

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—22 **6 Claims**

1. An aqueous ink composition which contains water-soluble dye dissolved in water, said water-soluble dye comprising at least one water-soluble azo dye represented by formula (I)





(I)

wherein R_1 represents an amino group, R_2 represents an alkyl group, and M represents a hydrogen atom, an alkali metal, an ammonium group or an organic amine group, wherein the water-soluble dye is incorporated in the ink composition in an amount of from 0.2 to 10 wt% based on the weight of the ink composition.

4,512,808

BINDER COMPOSITIONS BASED ON ALKALI METAL SILICATE SOLUTIONS

Wolfgang Pesch, Grevenbroich, and Günter Beer, Duisburg, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,393

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314475

Int. Cl.³ C08L *91/00, 95/00*

U.S. Cl. 106—83 **18 Claims**

1. A binder composition comprising:

(a) at least one alkali silicate aqueous solution whose mol ratio of SiO_2 to Me_2O is about 3–5:1 and wherein the silicate content is about 12–30% by weight, based on the total weight of the composition;

(b) at least one water-soluble copolymer of maleic acid anhydride and an ethylene or a methylvinyl ether, whose anhydride groups are hydrolyzed and neutralized, present in about 0.1–1.5% by weight, based on the total weight of the composition; and

(c) water for the remaining balance.

4,512,809

PROCESS FOR PRODUCING, FROM ALUMINOUS SILICEOUS MATERIALS, CLINKER CONTAINING ALKALI METAL ALUMINATE AND DICALCIUM SILICATE, AND USE THEREOF

Hans C. A. Nielsen, Copenhagen, Denmark, and Roberto Schroeder, Mexico City, Mexico, assignors to Industrias Penoles S.A. de C.V., Mexico

Continuation of Ser. No. 392,389, Jun. 28, 1982, abandoned. This application Jan. 25, 1984, Ser. No. 573,811

Claims priority, application United Kingdom, Jul. 6, 1981, 8120849

Int. Cl.³ C04B *7/24*; C01F *7/02*

U.S. Cl. 106—103 **7 Claims**

1. A process for the production of clinker containing alkali metal aluminate and dicalcium silicate from aluminous siliceous starting materials including the steps of mixing and grinding the aluminous siliceous starting material with at least one of the group consisting of calcareous correction materials and alkali metal-containing correction materials to a finely ground dry raw mixture comprising oxides of aluminium, silicon, calcium and alkali metals having the mole ratios CaO/SiO_2 and Me_2O/Al_2O_3 (Me=alkali metal) equal to approximately 2 and 1, respectively, and sintering the raw mixture to clinker containing alkali metal aluminate and dicalcium silicate in a burning step comprising preheating said finely ground dry raw mixture to 700°–1050° C. by suspending said raw mixture in a hot gas in a preheating zone, precipitating said preheated material from said hot gas to provide a precipitated material and sintering said precipitated material to said clinker in a clinker burning zone in a rotary kiln in a period of 10 to 15 minutes.

4,512,810

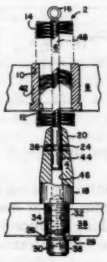
BOLSTER PIN AND METHOD FOR CLEANING FLASK BUSHING

Earl C. Gahlinger, Ekron, Ky., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 18, 1984, Ser. No. 572,090

Int. Cl.³ B08B *1/00*

U.S. Cl. 134—8 **22 Claims**



18. A method of cleaning the bore in the flask flange of a mold set of flask with a bore and bolster with a bolster pin comprising:

attaching a bolster pin to a bolster flange, said bolster pin having a base portion adjacent to the bolster and an elongated member projecting towards the flask flange, said elongated member having brush elements generally projecting radially outward from said elongated element;

aligning the bore in the flask flange with said bolster pin;

joining the flask flange and the bolster flange; and

brushing the flask flange bore as said bolster pin brush elements move relative to the flask bore.

4,512,811

METHOD AND APPARATUS FOR CLEANING CONTAINERS

Rupert Binnig, Mainz-Bretzenheim; Günter Gerlach, Hochheim; Peter Nilles, and Jürgen Pankatz, both of Bad Kreuznach, all of Fed. Rep. of Germany, assignors to SEITZ ENZINGER NOLL Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,265

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207225

Int. Cl.³ B08B *9/08*

U.S. Cl. 134—10 **17 Claims**

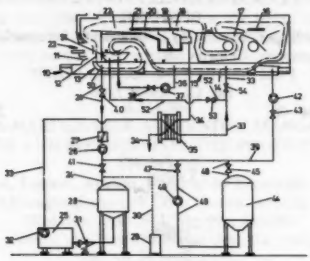
1. A method of reducing the amount of harmful material which could pass into waste water from a container cleaning machine which comprises a preliminary soaking tank, a subsequently arranged soaking and washing solution bath which includes at least one soaking bath, and spraying sections which are arranged after said soaking and washing solution bath; said method including the steps of:

providing soaking solution as bath solution for said preliminary soaking tank;

diverting at least a partial flow of said soaking solution taken from said preliminary soaking tank and thereupon cleaning harmful material from such partial flow for reducing harmful materials therewith;

returning said cleaned soaking solution to either said preliminary soaking tank of said at least one soaking bath, which are of comparable wash solution concentration, for further handling of containers while observing the bath solution levels which are to be maintained, and an adequate wash solution regeneration;

withdrawing used spray water from said spraying sections, while bypassing said preliminary soaking tank, and supplying said used spray water to the waste water;



returning said cleaned partial flow to said preliminary soaking tank;

replacing missing amounts of soaking solution in said preliminary soaking tank from said at least one soaking bath of said soaking and washing solution bath, which has a comparable wash solution concentration;

effecting an adequate wash solution regeneration of said soaking and washing solution bath by removing a partial quantity of bath solution from said soaking bath, cleaning same, and returning it to said soaking bath; and at predetermined time intervals, alternately supplying to a common wash solution cleaning device said partial flow removed from said preliminary soaking tank, and said partial quantity removed from said soaking bath.

4,512,812

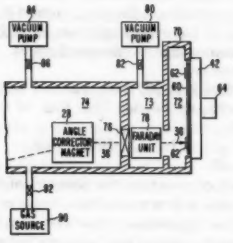
METHOD FOR REDUCING PHOSPHOROUS CONTAMINATION IN A VACUUM PROCESSING CHAMBER

Reuel B. Liebert, Peabody, and Carl J. Russo, Ipswich, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 22, 1983, Ser. No. 534,950

Int. Cl.³ B08B *7/04, 9/00*

U.S. Cl. 134—21 **5 Claims**



1. A method for removing phosphorous contaminants from a vacuum processing chamber comprising the steps of:

introducing water vapor into said vacuum chamber to react with said phosphorous contaminants and form a compound more volatile than said phosphorous contaminants; and

removing said volatile compound from said vacuum chamber.

4,512,813

METHOD FOR TREATING WOODEN ARTICLES

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 455,317, Jan. 3, 1983, and a continuation-in-part of Ser. No. 455,268, Jan. 3, 1983, and a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, and a continuation-in-part of Ser. No. 444,667, Nov. 26, 1982, and a continuation-in-part of Ser. No. 453,282, Dec. 27, 1982, and a continuation-in-part of Ser. No. 453,496, Dec. 27, 1982. This application Apr. 7, 1983, Ser. No. 482,942

Int. Cl.³ B08B *3/08;* **B29C** *17/08*

U.S. Cl. 134—27 **19 Claims**

1. A method for treating the surface of a wooden article, which method comprises contacting said surface with a composition comprising the monourea adduct of sulfuric acid under conditions of contact time, dosage rate of said composition, and contact temperature sufficient to ablate at least a portion of the contacted surface of said wooden article.

4,512,814

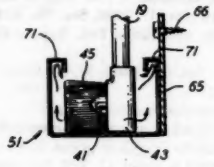
BRUSH CONDITIONER FOR CAR WASH

James C. Buck, 269 Margaret St., Plattsburgh, N.Y. 12901

Filed Nov. 2, 1983, Ser. No. 547,859

Int. Cl.³ B08B *3/10*

U.S. Cl. 134—34 **7 Claims**



5. A method of storing and cleaning a long handled car washing brush having a nozzle for directing a stream of liquid through the brush bristles that includes the steps of

immersing the brush bristles within a bath of liquid cleaner contained within a trough having a top opening,

supporting the brush handle so that the nozzle is directed at a wall of the trough,

sending a stream of liquid through the nozzle with sufficient pressure to agitate the bath liquid and force it upwardly along said wall,

redirecting the agitated bath liquid back toward the brush bristles whereby the bristles are scrubbed by the liquid, and

heating the bath liquid to a temperature above the freezing temperature of the said liquid.

4,512,815

SIMPLIFIED BIFET PROCESS

Wadie N. Khadder, Sunnyvale; Jia T. Wang, San Jose, and Brian E. Hollins, Los Altos, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 153,486, May 27, 1980, Pat. No. 4,412,238. This application Jan. 31, 1983, Ser. No. 462,498

Int. Cl.³ H01L *7/54, 29/78*

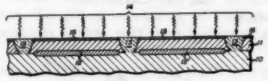
U.S. Cl. 148—1.5 **5 Claims**

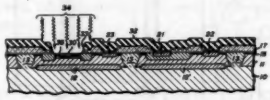
1. The process for fabricating an integrated circuit contain-

ing bipolar junction transistors and junction field effect transistors, in a common substrate semiconductor of one conductivity type having thereon an epitaxial layer of opposite conductivity type and isolation diffusions of said one conductivity type isolating individual tubs of said epitaxial layer, comprising the steps:

removing oxides from the top surface of said epitaxial layer;

ion implanting a slow diffusing first impurity having said opposite conductivity type into said surface;





thereafter, forming by oxide masked diffusion, the base regions of said bipolar junction transistors simultaneously with the spaced-apart source and drain electrodes of said junction field effect transistors;

ion implanting a second impurity of said one conductivity type into the gate regions of said junction field effect transistors in the space between said source and drain electrodes to a depth exceeding that of said first impurity, whereby said first impurity layer acts as a top gate electrode for said junction field effect transistors, and as a field inversion prevention layer for said integrated circuit.

4,512,816

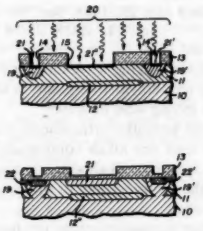
HIGH-DENSITY IC ISOLATION TECHNIQUE CAPACITORS

Amolak R. Ramde, San Jose; Wadie N. Khadder, Sunnyvale, and Surinder Krishna, Fremont, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 352,630, Feb. 26, 1982, abandoned, which is a continuation of Ser. No. 149,203, May 12, 1980, abandoned. This application Apr. 23, 1984, Ser. No. 602,264

Int. Cl.³ H01L *21/265, 21/20*

U.S. Cl. 148—1.5 **5 Claims**



1. In the process for creating an isolation diffusion in a monolithic integrated semiconductor device which includes active transistors that have emitter, base and collector regions, wherein a thin epitaxial layer of semiconductor is deposited upon an opposite conductivity type semiconductor substrate and employing a slow diffusing impurity type buried layer, the steps comprising:

forming a masking oxide layer over said epitaxial layer;

removing said masking oxide in those areas where isolation diffusion is desired and in those areas where transistor bases are desired whereby said transistor bases are automatically aligned with respect to said isolation;

temporarily masking the areas in which transistor bases are desired;

ion implanting a fast diffusing impurity species into said thin epitaxial layer in said areas of isolation diffusion; and

heating said semiconductor to diffuse said fast diffusing impurity completely through said epitaxial layer whereby the penetration of said buried layer into said epitaxial layer is minimized permitting a reduced thickness epitaxial layer to about 9μ.

4,512,817

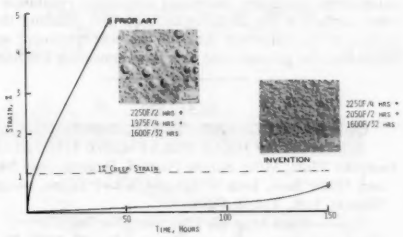
METHOD FOR PRODUCING CORROSION RESISTANT HIGH STRENGTH SUPERALLOY ARTICLES

David N. Duhl, Newington; Otis Y. Chen, Manchester, and Maurice L. Gell, Newington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 30, 1981, Ser. No. 335,962

Int. Cl.³ C22F *1/10*

U.S. Cl. 148—3 **3 Claims**



1. A method for simultaneously improving the mechanical properties of an alloy article consisting essentially of: 20–25%, Cr, 1–5% W, 0.5–3% Ta, 1–4% Al, 1.7–5% Ti, 15–25% Co, 0–3% Cb, balance essentially nickel, said alloy having a gamma prime solvus temperature and an incipient melting temperature, while at the same time applying an adherent protective coating, comprising the steps of:

a. forming a single crystal article from the alloy;

b. solution treating the alloy at a temperature between the gamma prime solvus temperature and the incipient melting temperature;

c. applying a protective coating to the single crystal selected from the group consisting of aluminide coatings and overlay coatings;

d. heat treating the coated article at a temperature above but within about 100° F. of the gamma prime solvus temperature;

e. aging the coated article at a temperature below the gamma prime solvus temperature;

so that heat treated articles exhibit a rupture life in excess of about 400 hours when tested under conditions of 40 ksi at 1600° F. and the coating and substrate are not excessively interdiffused.

4,512,818

SOLUTION FOR FORMATION OF BLACK OXIDE

Silvester Valayil, Shrewsbury; Magda Abu-Moustafa, Lexington, and Terry A. Benjamin, Acton, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation-in-part of Ser. No. 497,084, May 23, 1983, abandoned. This application Jun. 4, 1984, Ser. No. 616,692

Int. Cl.[3] C23F *5/02, 5/04*

U.S. Cl. 148—6.14 R 22 Claims

1. A process for manufacturing a multilayer circuit board comprising laminating copper to a dielectric material using heat and pressure and contacting the laminate at elevated temperature with an aqueous alkaline solution of an oxidant selected from the group of salts of chlorites and per compounds containing a minor amount of a water soluble or dispersible synthetic polymer in a concentration varying between about 3 and 100 parts per million parts of solution for a time sufficient to form a dense, non-frangible oxide coating on said copper.

4,512,819

METHOD FOR MANUFACTURING A CLADDING TUBE OF A ZIRCONIUM ALLOY FOR NUCLEAR REACTOR FUEL OF A NUCLEAR REACTOR FUEL ASSEMBLY

Eckard Steinberg, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,795

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248686

Int. Cl.[3] C22F *1/18*

U.S. Cl. 148—11.5 F 3 Claims

1. Method for manufacturing a cladding tube of a zirconium alloy for the nuclear reactor fuel of a nuclear reactor fuel assembly by deformation of a starting tube and subsequent post-treatment of the deformed starting tube, the improvement comprising imparting increased corrosion resistance to the outer surface of the cladding tube by first grinding the outer surface of the deformed tube for the post-treatment and then subjecting the ground tube to a final annealing treatment.

4,512,820

IN-PILE PARTS FOR NUCLEAR REACTOR AND METHOD OF HEAT TREATMENT THEREFOR

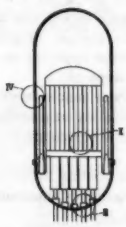
Yasuhiko Mori, Mito; Shigeo Hattori, Ibaraki; Isao Masaoka, and Hisao Itow, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,371

Claims priority, application Japan, May 30, 1980, 55-73208

Int. Cl.[3] C22C *19/05;* C22F *1/10*

U.S. Cl. 148—12.7 N 22 Claims



1. In-pile parts for a nuclear reactor made of alloy, of precipitation hardening type, consisting essentially of by weight 0.01–0.2% C, 10–21% Cr, 1–4% Ti, 0.3–2% Nb, 0.1–2% Al and the balance Ni wherein Ti content being higher than Nb content, said alloy having the microstructure of chromium carbides precipitated in the grain boundaries and a γ' phase precipitated in the grains such that in the vicinity of the grain boundaries γ' phase is precipitated in all zones, with the matrix thereof being austenite in microstructure, whereby said microstructure provides reduction of stress corrosion cracking of the alloy.

4,512,821

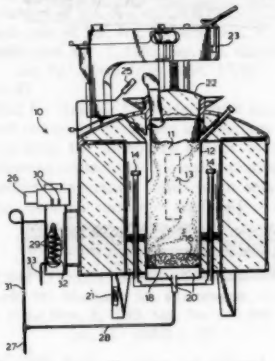
METHOD FOR METAL TREATMENT USING A FLUIDIZED BED

Robert Staffin, Colonia; Carol A. Girrell, North Brunswick, and Mario A. Fronzoni, East Brunswick, all of N.J., assignors to Procedyne Corp., New Brunswick, N.J.

Filed Dec. 20, 1982, Ser. No. 450,921

Int. Cl.[3] C21D *1/53*

U.S. Cl. 148—16.5 15 Claims



1. A method of producing chemically controlled atmospheres for treating metal workpieces in fluidized beds, which comprises:

providing a precursor liquid that upon decomposition establishes a desired atmosphere in a fluidized bed;

vaporizing the precursor liquid externally of the fluidized bed;

introducing the vaporized precursor liquid into a plenum associated with the fluidized bed;

maintaining the vaporized precursor liquid within the plenum at temperatures between its vaporization and decomposition temperatures;

introducing the vaporized precursor liquid to the fluidized bed wherein it thermally decomposes into selected chemical entities that provide at least a portion of the desired atmosphere.

4,512,822

NON-HYGROSCOPIC WELDING FLUX BINDERS

Eric A. Barringer, Waltham, and Thomas W. Eagar, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 29, 1984, Ser. No. 626,613

Int. Cl.[3] B23K *35/34*

U.S. Cl. 148—24 6 Claims

1. A process for making a welding flux comprising:

a. dissolving tetraalkylorthosilicate in alcohol;

b. diluting a strong acid in water;

c. reacting the tetraalkylorthosilicate and acid solutions;

d. adding at least one alkali compound;

e. adding at least one alkaline earth compound;

f. adjusting the solids content of the suspension of step (e) to 40–60% solids;

g. neutralizing the acid to cause gel formation; and

h. firing the 40–60% solids suspension at a temperature between 400° C. and 1000° C. for between six and 24 hours.

4,512,823
BARIUM OR CHROMIUM ADDITIVES TO MAGNESIUM OXIDE COATING SLURRY

Michael W. Howe, Pittsburgh, Pa., and Samuel W. Sopp, Foster City, Calif., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 421,664, Sep. 22, 1982, abandoned. This application Apr. 10, 1984, Ser. No. 598,641

Int. Cl.[3] H01F *1/04*

U.S. Cl. 148—113 5 Claims

1. A slurry for use in the initial coating of silicon steel prior to high temperature annealing, comprising 8 to 15 percent by weight magnesium oxide, at least 0.01 mole percent, on a magnesium oxide basis, of at least one inorganic compound selected from the group consisting of barium oxide, barium nitrate, chromium nitrate, and their hydrates, and the balance water.

3. A process for coating silicon steel, comprising initially coating the steel with a magnesium oxide slurry prior to high temperature annealing, the improvement wherein at least one inorganic compound selected from the group consisting of barium oxide, barium nitrate, chromium nitrate, and their hydrates is pre-mixed in the slurry so as to form a slurry that comprises 8 to 15 percent by weight magnesium oxide, at least 0.01 mole percent, on a magnesium oxide basis, of an inorganic compound selected from the group consisting of barium oxide, barium nitrate, chromium nitrate, and their hydrates, and the balance water.

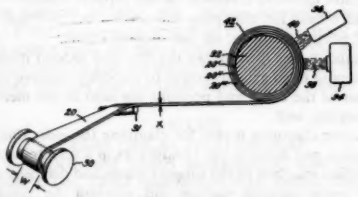
4,512,824
DYNAMIC ANNEALING METHOD FOR OPTIMIZING THE MAGNETIC PROPERTIES OF AMORPHOUS METALS

Alan I. Taub, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,299

Int. Cl.[3] H01F *1/00*

U.S. Cl. 148—121 17 Claims



1. A method for forming a substantially stress-free discrete body, said body being in the form of a plurality of layers of a continuous length of a ribbon-like body of amorphous metallic alloy, comprising the steps of:

(1) traversing a single thickness of said ribbon-like body across at least one forming means to form each predetermined increment of said ribbon-like body to substantially the same configuration it is to have in the completed discrete body;

(2) heating the formed single thickness of said ribbon-like body while in contact with said forming means to the highest peak temperature at the most rapid heating rate attainable subject to the proviso that substantially no crystallization is induced in said ribbon-like body in the time required during this heating step to reduce the stresses in said material by at least 90% of the stresses present in said amorphous material immediately prior to initiation of said heating;

(3) rapidly cooling the formed single thickness of said ribbon-like body at a rate of at least about 100° C./min while in contact with said forming means; and

(4)thereafter wrapping said ribbon-like body about itself layer upon layer thereby forming said discrete body.

10. A method for forming a substantially stress-free discrete body, said body being in the form of a plurality of layers of a continuous length of a ribbon-like body of amorphous metallic alloy, comprising the steps of:

(1) traversing a single thickness of said ribbon-like body across at least one forming means to form each predetermined increment of said ribbon-like body to substantially the same configuration it is to have in the completed discrete body;

(2) heating the formed single thickness of said ribbon-like body while in contact with said forming means to the highest peak temperature attainable at a rate greater than about 300° C./min subject to the proviso that substantially no crystallization is induced in said ribbon-like body in the time required during this heating step to reduce the stresses in said material by at least 90% of the stresses present in said amorphous material immediately prior to initiation of said heating;

(3) rapidly cooling the formed single thickness of said ribbon-like body at a rate of at least about 100° C./min while in contact with said forming means; and

(4) thereafter wrapping said ribbon-like body about itself layer upon layer thereby forming said discrete body.

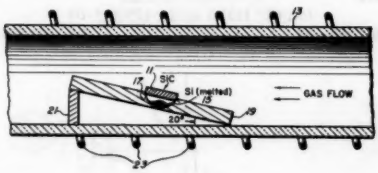
4,512,825
RECOVERY OF FRAGILE LAYERS PRODUCED ON SUBSTRATES BY CHEMICAL VAPOR DEPOSITION

Arrigo Addamiano, Alexandria, Va., and Philipp H. Klein, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1983, Ser. No. 484,346

Int. Cl.[3] H01L *21/205, 21/461*

U.S. Cl. 148—175 14 Claims



1. A method of recovering intact at room temperature a layer of a first material produced by depositing it from the gas phase at a deposition temperature above room temperature on a substrate of a second material having a lower melting point and a different coefficient of thermal expansion than that of the first material, the uncoated side of the substrate being the underside of the substrate and the side of the layer adjacent to the substrate being the underside of the layer, comprising the steps of:

supporting the substrate underside around its perimeter along a support plane at a non-orthogonal incline from horizontal;

separating the substrate from the layer by heating the substrate to melt the substrate from the layer;

receiving the freed layer underside around its perimeter along a plane parallel to the support plane after it displaces in the range of the thickness of the substrate; and

cooling the separated layer to room temperature,

whereby the separated layer is not subjected to stresses caused by the different thermal expansion of the substrate and layer when they are cooled to room temperature.

4,512,826
PRECIPITATE HARDENED TITANIUM ALLOY COMPOSITION AND METHOD OF MANUFACTURE

Sung-Hyun Whang, Brookline, Mass., assignor to Northeastern University, Boston, Mass.

Filed Oct. 3, 1983, Ser. No. 538,343
Int. Cl.[3] C22C *14/00*; C22F *1/18*
U.S. Cl. 148—407 22 Claims

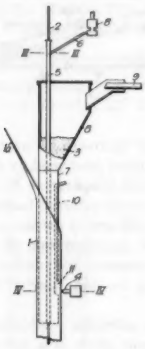
1. A titanium base alloy containing, a IIIA, a IVA metal, and a rare earth metal having a boiling point higher than the melting point of titanium, said alloy having been rapidly quenched at a rate which permits formation of spherical precipitates in the 50–100 Angstrom diameter range from the liquid form of the alloy to prevent segregation, said alloy containing a homogeneous compound of the rare earth, a IIIA, and a IVA metal in the form of said spherical precipitates, at least some of the spherical precipitates having diameters of 50–100 Angstroms prior to any annealing step.

4. A method of increasing the strength of an alpha-titanium or near alpha-titanium alloy comprising adding to said alloy a IIIA, IVA metal and a rare earth metal having a boiling point higher than the melting point of titanium, rapidly solidifying the resulting alloy at a rate which permits formation of spherical precipitates in the 50–100 Angstrom diameter range from the liquid form of the alloy to prevent segregation whereby said allow contains a homogeneous compound of the rare earth, a IIIA and a IVA metal in the form of said spherical precipitates, at least some of the spherical precipitates having diameters of 50–100 Angstroms prior to any annealing step, and heat treating the rapidly solidified alloy in an oxygen free atmosphere.

4,512,827
METHOD OF MANUFACTURING MINERAL INSULATED ELECTRIC CABLE AND LIKE ELEMENTS

Dennis Gill, Lancashire, England, assignor to Associated Electrical Industries Limited, England

Filed Aug. 20, 1982, Ser. No. 410,051
Claims priority, application United Kingdom, Sep. 21, 1981, 8128424
Int. Cl.[3] H01B *13/10*; H01C *1/03*
U.S. Cl. 156—48 5 Claims



1. The method of manufacturing mineral insulated electric conductive cable comprisng steps of

A. continuously at a first position bending a ductile metal strip into tubular form,

B. continuously at a second position downstream of the first position welding the edges of the strip together to form a sheath,

C. continuously at positions downstream of the second position introducing into the sheath being continuously formed

(i) electrical conductive wire

(ii) a filling of powdered insulating material and

(iii) a liquid hydrophobic material in the form of liquid silicone,

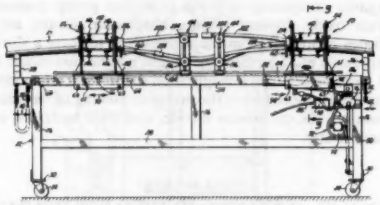
D. the liquid silicone being introduced into the sheath separately from the powdered insulating material, and

E. subsequently continuously reducing the diameter of the continuously formed sheath.

4,512,828
CABLE HOLDING AND POSITIONING APPARATUS AND SPLICING METHOD

Emanuel Helm, 528 E. Capitol Ave., Bismarck, N. Dak. 58501

Filed Dec. 27, 1983, Ser. No. 565,280
Int. Cl.[3] H01B *13/00*
U.S. Cl. 156—49 16 Claims



1. An apparatus for holding and positioning a first multi-strand cable end portion and a second multi-strand cable end portion during splicing and wherein the first and second multi-strand cable end portions each have a plurality of electrical conductors, the apparatus comprising:

a support frame having an upper support surface;

first means for clamping the first multi-strand cable end portion movably disposed on the support frame;

second means for clamping the second multi-strand cable end portion disposed on the support frame;

hydraulic means for moving the first and second means for clamping in an axial direction of the cable relative to each other as the cable end portions are held in the means for clamping; and

conductor clamping means for clamping the individual conductors and holding the conductors in a selected splicing position attached to the support frame and disposed above the upper support surface and wherein the conductor clamping means includes a plurality of individual conductor clamps, each conductor clamp attached to a corresponding clamp support extending above the upper support surface and clamp support selectively positionable in the axial direction and in an angular direction.

14. A method for splicing a first multi-strand cable end portion with a second multi-strand cable end portion, each multi-strand cable end portion having a plurality of individual conductors, the method comprising:

positioning the first and second multi-strand cable end portions within first and second clamping mechanisms, respectively;

positioning and separating a plurality of the individual conductors of the first multi-strand cable, each conductor in a separate conductor clamp and positioning and separating a plurality of the individual conductors of the second multi-strand cable, each in a separate conductor clamp, so that ends of corresponding conductors of the first and second multi-strand cables are in substantial alignment with individual conductors of the same multi-strand cable being in a retained spaced-apart relationship with each other;

splicing individually one conductor of the first multi-strand cable end portion with one conductor of the second multi-strand cable end portion and continuing splicing until all

the individual conductors of the first and second multi-strand cable end portions are spliced;

moving the first clamping means away from the second clamping means to stretch and straighten and bring together all the spliced individual conductors; and

rotating the first clamping means in an angular direction so that the spliced conductors are placed in an angular twisted relationship with respect to the axis of the first and second cable end portions.

4,512,829

PROCESS FOR PRODUCING PRINTED CIRCUIT BOARDS

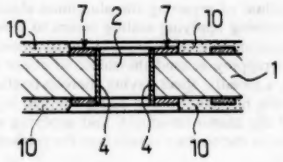
Hideo Ohta, Nara; Tatuzo Hakuzen, Osaka; Yasunori Ito, Osaka, and Fusao Takagi, Osaka, all of Japan, assignors to Satosen Co., Ltd., Osaka, Japan

Filed Apr. 6, 1984, Ser. No. 597,315

Claims priority, application Japan, Apr. 7, 1983, 58-61866; Apr. 7, 1983, 58-61867

Int. Cl.³ B05D *5/12;* **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—659.1 **5 Claims**



1. A process for producing a printed circuit board characterized by the steps of drilling holes in a copper clad laminate, treating the entire surface of the laminate including the hole-defining inner surfaces with a catalyst, removing the catalyst from the surface of the copper foil of the laminate by mechanically cleaning the surface of the copper foil, depositing electroless nickel only on the hole-defining inner surfaces, forming a pattern with an etching resist, etching away the copper foil except at the pattern area, removing the etching resist, masking with a solder resist the entire surface except at the hole-defining inner surfaces and the lands, and subjecting the hole-defining inner surfaces and the lands to electroless copper plating.

4,512,830

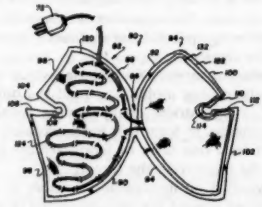
ELECTRICAL HEATING CAP

John G. Hulett, and Robert Rothenberger, both c/o Dallas Products, Inc., 13948 Distribution Way, Dallas, Tex. 75234

Division of Ser. No. 314,747, Oct. 26, 1981, Pat. No. 4,459,471. This application Oct. 20, 1983, Ser. No. 543,985

Int. Cl.³ B32B *3/00;* **B29D** *23/10;* **H05B** *3/06;* **A42B** *1/22*

U.S. Cl. 156—70 **4 Claims**



1. A method of manufacturing a heating cap to be worn during a hair treating process, comprising:

providing identically shaped first and second flat flexible plastic members, each member having a pair of wing-shaped portions which are mirror-images of each other, and which are joined together by a common bridge portion, each wing-shaped portion including first and second curvilinear edges separated by said bridge portion and opposed circular apertures formed in said members, respectively,

providing a piece of insulation material having the general shape of each of said wing-shaped portions,

placing one of said pieces of insulation material on each wing-shaped portion of said first member,

placing a resistance type electrical heating element on each piece of insulation material on said first member,

placing another of said pieces of insulation material on each piece of insulation material on said first member and covering said heating element on each wing-shaped portion,

placing said second member over said first member and aligned therewith so that the peripheral edges of said members including edges defining said apertures are coextensive;

securing said members together along said edges,

folding each of said first and second members along their respective common bridge portions so that the corresponding mirror-image wing-shaped portions of both members overlay and are aligned with each other; and

attaching the curvilinear edges formed by one of the wing shaped portions of said first and second members to the curvilinear edges of the mirror image wing shaped portions of said first and second members to form a flat heating cap having flexible sides which separate to form a cavity conforming substantially to the shape of a human head.

4,512,831

METHOD FOR FORMING A LAYER OF BLOWN CELLULAR URETHANE ON A CARPET BACKING

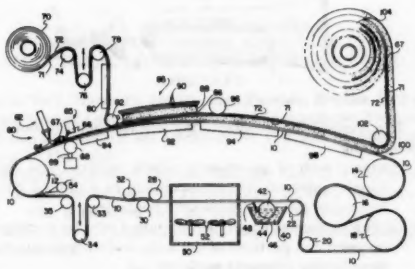
John G. Tillotson, Tiarco Dr., Dalton, Ga. 30720

Continuation of Ser. No. 000,478, Jan. 2, 1979, Pat. No. 4,405,393, which is a continuation of Ser. No. 872,341, Jan. 25, 1978, Pat. No. 4,132,817, which is a continuation-in-part of Ser. No. 782,636, Mar. 30, 1977, Pat. No. 4,171,395. This application Sep. 12, 1983, Ser. No. 531,282

The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.

Int. Cl.³ B32B *31/00, 5/20*

U.S. Cl. 156—78 **3 Claims**



1. Method for producing a layer of flexible chemically blown urethane foam cushion having a density of between one and ten pounds per cubic foot on the back of a carpet product, in which a mixture of reactive urethane forming components, including isocyanate and polyol, is prepared, the mixture is depositioned on a carrier belt, the back of a preheated carpet product is brought into contact with the mixture, and the mixture which is in contact with the carpet back is chemically blown in a heated urethane foaming station into an enlarged layer of cellular urethane and cured under the effect of heat, comprising the steps of:

(1) mixing the reactive components together in a traversing mixer at a temperature of between 60° and 100° F. and

dispensing the mixed components onto an endless carrier belt which has been cooled to a temperature of between 50° and 100° F., said reactive components including water at a concentration of 0.01 to 5.0 parts per hundred parts of polyol over and above the water normally present in the reaction mixture and a catalyst which will promote a polyurethane formation reaction and concurrently promote a chemical blowing reaction so that an expansion of between 500 percent and 6400 percent is obtained for the polyurethane material;

(2) partially reacting the mixed components on the carrier belt by heating the mixed components to a temperature of between 90° and 150° F.;

(3) preheating the lower surface of an uncoated carpet material to a temperature of between 100° and 300° F.;

(4) bring the lower surface of the preheated carpet material into flush contact with the partially reacted urethane component mixture;

(5) passing the carrier belt, with its urethane mixture, and the carpet material through a urethane forming station at the same speed;

(6) heating the urethane mixture to a temperature of between 120° and 200° F. in the urethane forming station for a period of 15 seconds to 120 seconds and permitting upward movement of the carpet material as the reactive urethane mixture chemically blows during urethane formation; and

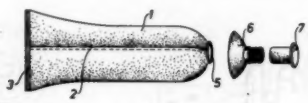
(7) curing the blown urethane foam by heating the foam to a temperature of between 150° and 350° F.

4,512,832

METHOD FOR MANUFACTURING A TUBE PACKAGE

Hans Rausing, Lund, Sweden, assignor to Tetra Pak Developpement SA, Pully, Switzerland

Filed Jun. 17, 1982, Ser. No. 389,567
Claims priority, application Sweden, Jun. 18, 1981, 8103848
Int. Cl.³ B29C *27/10*
U.S. Cl. 156—86 **6 Claims**



1. A method for manufacturing tubular packing containers, comprising:

cutting a web of an oriented plastic material into shorter lengths substantially corresponding to a desired circumference of the tubular packing containers;

folding its shorter length of web into a tube by overlapping opposed end portions of the web, said opposing end portions having opposing surfaces;

extruding a string of melted plastic material onto at least one of said opposing surfaces of the overlapping opposed edge portions of the web;

pressing said overlapping edge portions of the web to each other aginst said string so as to prevent release of orientation stresses of the plastic material thereby avoiding shrinkage of the overlapping opposed edge portions of the web;

placing each tube of web material on a mandrel;

heating a portion of each tube thereby shrinking that portion of the tube over an underlying profiled portion of the mandrel; and

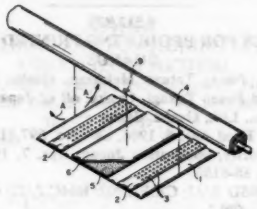
removing the tube from the mandrel.

4,512,833

ALUMINUM-SHIELDED COAXIAL CABLE REPAIR

Thomas A. Kridl, Union City, and Carney P. Claunch, II, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 12, 1983, Ser. No. 560,286
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—94 **13 Claims**



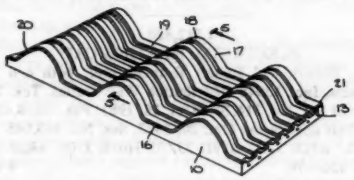
7. A method of repairing the aluminum shield of a coaxial cable comprising applying sealing means to close the opening in the aluminum shield to provide environmental seal of the opening; wrapping around the shield to cover an opening in the shield, a metallic sheet having thereon contact means having sufficient hardness to and being adapted to penetrate the surface of the aluminum shield; and applying a compression force to force the contact means into the surface of the aluminum shield.

4,512,834

METHOD OF MAKING REDUCED NOISE POSITIVE DRIVE POWER TRANSMISSION SYSTEM

Robert C. Kohrn, Bethany, Conn., assignor to Uniroyal Inc., Middlebury, Conn.

Division of Ser. No. 75,476, Sep. 14, 1979, Pat. No. 4,416,649.
This application Feb. 7, 1983, Ser. No. 464,447
Int. Cl.³ B29H *7/22*; F16G *5/20*
U.S. Cl. 156—138 **9 Claims**



1. A method of molding toothed positive drive transmission belts having surface discontinuities on the belts working surface, the teeth being spaced from each other by a land surface, comprising the steps of:

helically winding thread of a material which does not bond to the belts during molding around the outer circumference of a cylindrical mold having axially extending grooves therein to form belt tooth cavities;

applying at least one layer of fabric around the circumference of the mold over the thread;

helically winding an inextensible member in a plurality of convolutions around the circumference of the mold over the fabic to form a load carrying member for the belt;

applying a layer of moldable elastomer over the member;

heating and applying pressure to the layer of elastomer to force the softened elastomer through the spaces between successive convolutions of the member and filling the belt tooth cavities by forcing the fabric and the thread into contact with the walls of the grooves and filling the space between the fabric and the member with the elastomer;

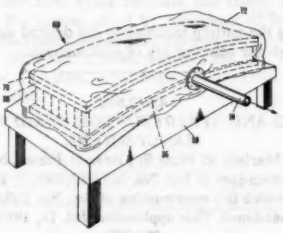
removing the resulting belt slab from the mold and removing the thread from the belt slab, thereby forming surface discontinuities in the belt extending substantially in the longitudinal operating direction of the belt.

4,512,835

METHOD OF MAKING A CURVED COMPOSITE BEAM

Richard J. Gardiner, Murray, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 6, 1983, Ser. No. 501,737
Int. Cl.[3] B65H *81/00*; E04C *3/46*
U.S. Cl. 156—174 1 Claim



1. A method for manufacture of curved fiber-reinforced composite beams, each of said beams having a web that extends longitudinally in an arc, and at least one flange projecting laterally from said web, said method comprising:

(a) winding layers of high strength filaments about the exterior surfaces of each of a plurality of mandrels, each of said mandrels having a top surface, side surfaces and a bottom surface, and being curved lengthwise along the intended arc for each said beam, said layers of high strength filaments being wet with a curable resin,

(b) placing the resin-wet, filament-wound mandrels on a support surface having substantially the same curvature as that of said mandrels, said support surface being covered with a layer of filament-reinforced material, and said filament-wound mandrels being placed in a side-by-side relationship, the side surfaces of said filament-wound mandrels being contiguous with side surfaces of adjacent filament-wound mandrels and the bottom surface of each mandrel being contiguous with the layer of filament-reinforced material on said support surface,

(c) placing a second layer of filament-reinforced material over the top surface defined by the plurality of top surfaces of each of said mandrels, the top surfaces of said mandrels being contiguous with the second layer of filament-reinforced material,

(d) curing the resulting assemblage comprising the bottom layer of filament-reinforced material, the filament-wound mandrels and the top layer of filament-reinforced material and

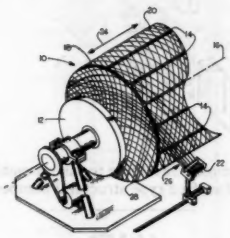
(e) cutting the resulting composite structure to provide a plurality of curved structural beams, in which each said web thereof is formed from those portions of filaments of said filament-wound mandrels that were on said contiguous side surfaces of said adjacent filament-wound mandrels.

4,512,836

METHOD OF PRODUCING COMPOSITE STRUCTURAL MEMBERS

Allan T. Tucci, Orange, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 22, 1983, Ser. No. 525,105
Int. Cl.[3] B29D *3/02*; B29G *1/00*; B29C *17/14*
U.S. Cl. 156—174 3 Claims



1. The method of fabrication of a 3-Dimensional part comprising the steps of:

depositing a first layer of reinforcements impregnated with curable resin on a mandrel parallel to the surface of the mandrel;

placing separators on a only portion of said first layer;

depositing a second layer of reinforcements impregnated with curable resin over the separators and said first layer forming a layered structure;

cutting said layered structure at the separators;

removing said layers from the mandrel;

parting the layers along said separators;

removing said separators from said reinforcements;

inserting a reinforcing material between the layers to replace the separators and to reinforce edges of said layers;

placing said cut and partially separated layers in a mold;

conforming the layered structure to the shape of the mold;

curing said impregnated reinforcements into a composite part; and

removing said composite 3-Deimensional part from and mold.

4,512,837

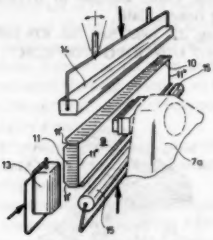
APPARATUS FOR MAKING A SURFACE TYPE STRUCTURAL COMPONENT, ESPECIALLY FOR AIRCRAFT

Branko Sarh, Hamburg, and Hartmut Pasenau, Bremen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 540,705, Oct. 11, 1983, which is a continuation of Ser. No. 228,680, Jan. 26, 1981, abandoned.
This application Oct. 20, 1983, Ser. No. 544,112
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003552
Int. Cl.[3] B31C *13/00*
U.S. Cl. 156—189 11 Claims

1. An apparatus for producing a surface type structural component having a grid structure comprising: a plurality of mold bodies formed with guide elements, means for wrapping strips of impregnated fiber material around the periphery of said mold bodies to form multi-layed box frames mounted on said mold bodies, a plurality of longitudinal carrier beams formed with guide rails for receiving the mold bodies with guide elements for assembling the mold bodies and box frames mounted on said mold bodies into longitudinal grid elements, cross guide means arranged on said longitudinal carrier beams with a predetermined spacing between said cross guide means, a plurality of cross beams including cross guide rails for receiv-

ing said cross guide means and for assembling said longitudinal grid elements to form said grid structure, and a gluing means



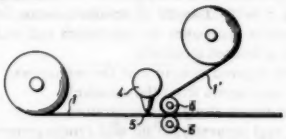
for applying a laminate sheathing to said assembled grid structure to form said surface type structural component.

4,512,838

EXTRUDED LONGITUDINAL JOINT

Anders R. Rausing, Lausanne, Switzerland, assignor to Tetra Pak Developpement SA, Pully, Switzerland

Filed Jan. 20, 1983, Ser. No. 459,700
Claims priority, application Sweden, Jan. 20, 1982, 8200289O
Int. Cl.³ B29D *23/10*
U.S. Cl. 156—203 **6 Claims**



1. A method for heat-sealing together two portions of orientation-stretched laminated polyester material, each portion of said material including a central layer of polyester positioned between two surface layers of glycol-modified polyester, comprising:

depositing a strand of molten plastic material of sufficient size on a first one of the two surface layers of glycol-modified polyester along an intended joint area so that the strand will have sufficient heat content to heat the two surface layers of glycol-modified polyester

joining a second one of the two surface layers of glycol-modified polyester to said strand so as to form a joined material having a joint area; and,

fusing the first and the second surface layers of the glycol-modified polyester to the strand while cooling the joint area to prevent heat from the molten strand of plastic material from diffusing into said central layer of polyester.

4,512,839

MULTI-COLOR SIGN MAKING METHOD AND LAYUP

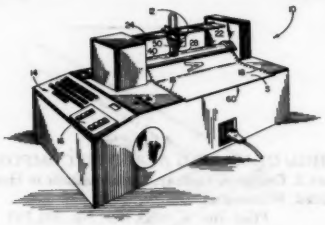
Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Filed Oct. 29, 1982, Ser. No. 437,876
Int. Cl.³ B26D *7/10*
U.S. Cl. 156—248 **9 Claims**

1. A method of making signs in multiple colors comprising:

providing a multi-ply layup of sign material composed of colored plies with at least one ply having one color and another ply having another, different color, a releasable adhesive securing each ply to the other plies in the layup, the bottom colored ply of the layup having a releasable adhesive on the bottom surface for securing the bottom colored ply to another object, and a ply of strippable release material protecting the adhesive on the bottom surface of the bottom colored ply and preventing the layup from adhering before removal of the release material;

placing the multi-ply layup of sign material in a cutting machine having an adjustable depth cutting tool for cutting through selected colored plies of the sign material in the multi-ply layup in a controlled cutting operation;



adjusting the depth of the cutting tool to penetrate through a selected ply other than the bottom colored ply of the layup; and

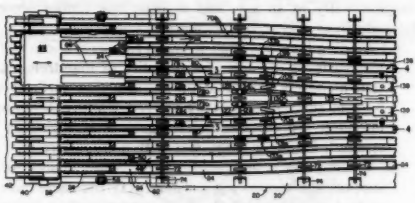
actuating the cutting machine to cut desired sign characters through the selected ply of sign material.

4,512,840

METHOD AND APPARATUS FOR WOOD FLOORING MANUFACTURE

Vincent J. Marino, 45 West St., Beverly Farms, Mass. 01915

Continuation-in-part of Ser. No. 231,862, Feb. 5, 1981, Pat. No. 4,360,992, which is a continuation of Ser. No. 963,094, Nov. 22, 1978, abandoned. This application Jul. 16, 1981, Ser. No. 284,077
Int. Cl.³ B32B *31/12, 31/20*
U.S. Cl. 156—304.1 **19 Claims**



5. Apparatus for assembling panel-like sections of flooring from fillets of wood or similar material, comprising

path means defining a plurality of substantially parallel elongated paths for rows of fillets to travel along said paths, including a central path and outer paths for central and outer rows of fillets,

moving means for moving said fillets along said paths,

a first glue station including glue-applying means between at least said central path and a second, outer path of said fillets for applying glue to opposing faces of fillets in said central and second paths,

a first pressing station located downstream of said glue station and including means for pressing fillets in said central and second paths, transversely to the elongation of said paths, whereby fillets in said central and second paths are bonded together,

a second glue station downstream of said first glue station and including second glue-applying means between at least said central path of fillets and a third, outer path of fillets for applying glue to opposing faces of fillets in said central and third paths, and

a second pressing station located downstream of said second

glue station and including second pressing means for pressing fillets in said central, second, and third paths transversely to the elongation of said paths, thereby to join together fillets in said central, second, and third paths.

15. A method for assembling panel-like sections of flooring from fillets of wood or similar material, said method comprising the steps of:

advancing first and second rows of fillets longitudinally side by side on assembly paths,

adhesively joining longitudinal edges of fillets in the first row to a first side of a fillet-separating cushion of compressible and expandable material, and

adhesively joining longitudinal edges of fillets in the second row to a second, opposite side of said cushion,

whereby said sections are assembled with said cushion, with said compression and expansion thereof, separating and holding together fillets of said first row and fillets of said second row.

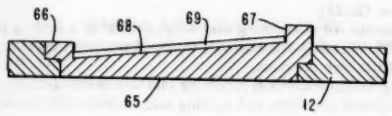
4,512,841
RF COUPLING TECHNIQUES

George F. Cunningham, Jr., Essex; John W. Lewis, Colchester; Robert B. McClure, Essex Junction, and Daniel J. Poindexter, South Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,189

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **19 Claims**



1. In a plasma etching apparatus an improved electrode for holding the product to be etched comprising:

an electrode plate having a plurality of apertures therein;

a workpiece holder positioned in each aperture;

each holder for holding a wafer in a preselected position and being tailored to alter the plasma around and over the holder to provide uniform etching over the surface of the wafer in the holder.

4,512,842
LABELING MACHINE

Egon Schneider, Neutraubling, Fed. Rep. of Germany, assignor to Krones AG Herman Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,525

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304191

Int. Cl.³ B65C *9/16, 9/42*

U.S. Cl. 156—357 **6 Claims**

1. A labeling machine wherein at least one glue pallet is moved in a circular path contiguous with a glue applicator, a label stack and a device for removing glue coated labels from the pallets for the labels to be applied to bottles conveyed through an application station, said machine comprising:

rotationally driven rotor means,

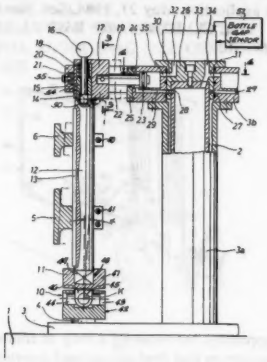
at least one oscillatingly driven member on said rotor means radially spaced from the rotor axis,

a pallet supporting shaft and a glue pallet mounted to the shaft, said shaft being coupled near one end to said driven member for being oscillated and for tilting between an active position most remote from said rotor axis and a neutral position closer to said axis,

movable support means mounted to said rotor means and bearing means on said support means supporting said shaft for oscillating,

means for sensing a gap in the series of bottles conveyed through said label application station, and

actuating means responding to a gap being sensed by moving said movable support means closer to said rotor axis to



thereby tilt the continuously oscillating shaft to neutral position so the pallet on said shaft cannot contact said glue applicator or a label in said stack as it continues in the circular path.

4,512,843
MANUFACTURING A CARRIER TAPE OR TAPES

Shu Miyazaki, Fussa, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,862

Claims priority, application Japan, Sep. 30, 1982, 57-171178; 57-171179

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—644 **12 Claims**

1. A method of manufacturing a carrier tape having a plurality of sets of sprocket holes and finger leads formed successively therein, with the sprocket holes along each of the opposite edges of the tape and the finger leads in a middle portion of the tape between the sprocket holes, the method comprising:

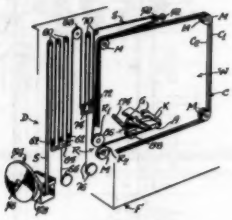
providing as a raw material a metallic foil tape of a width greater than the required width of the carrier tape, forming perforations spaced at fixed intervals along each of the opposite edges of the metallic foil tape, applying photoresist to both of the opposite surfaces of the metallic foil tape over a width greater than or equal to the required width of the carrier tape, then positioning the metallic foil tape for exposure to radiation by means of the perforations, irradiating the photoresist layers to form, in the photoresist layers, patterns for the sprocket holes and finger leads, removing either the portions of photoresist which have been irradiated or the portions which have not been irradiated, subsequently etching the resulting uncovered portions of the metallic foil tape to form the required sprocket holes and finger leads, and removing the remaining portions of photoresist.

4,512,844

ANVIL, GRIPPER, AND CUTTER ASSEMBLY IN A STRAPPING MACHINE

Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Glenview, Ill.

Division of Ser. No. 442,524, Nov. 19, 1982, Pat. No. 4,479,834.
This application May 21, 1984, Ser. No. 612,418
Int. Cl.³ B29C 27/08; B65B 13/32
U.S. Cl. 156—510 4 Claims



1. In an apparatus for securing a loop of thermoplastic strap around an article so that first and second overlapping portions of said strap are bonded together by means of a friction-fusion weld, said apparatus including (1) an anvil movable between an extended position for engaging said first overlapping strap portion and a retracted position spaced away from said extended position, (2) a strap engaging member for pressing against and gripping the outwardly directed surface of said second overlapping strap portion, (3) means for effecting relative movement between said anvil and at least said strap engaging member to compress said overlapping strap portions therebetween, and (4) means for moving said strap engaging member to cause bodily sliding frictional movement between the overlapping strap portions to melt interface regions which subsequently solidify to form said friction-fusion weld,

the improvement in said apparatus comprising:

a first carriage movable relative to said anvil between a retracted position and an extended position;

a second carriage movable relative to both said first carriage and said anvil between a retracted position and an extended position;

a pair of grippers pivotally mounted to said first carriage for pivoting between an open position and a closed position against the sides of said anvil to clamp an end of the strap against said anvil;

each said gripper being provided with a gripper link pivotally connected to the gripper and pivotally connected to said second carriage;

a pair of cutters pivotally mounted to said first carriage for pivoting between an open position and a closed position against, or partially extending into, the sides of said anvil to sever the strap at said anvil, a cutter link associated with each said cutter and being pivotally connected to the associated cutter and pivotally connected to said second carriage;

fixed, angled, abutment surfaces located to be engaged by a portion of each gripper when each gripper is pivoted away from the open position with the first carriage in the extended position; and

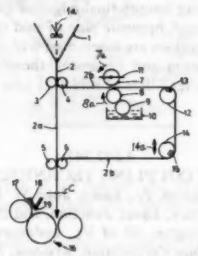
means for moving said second carriage from said extended position to said retracted position after said friction-fusion weld has been formed whereby rearward movement of said grippers and cutters is initially prevented as said grippers engage and slide along said angled abutment surfaces and pivot to said open positions and whereby said cutters, grippers, and first carriage are retracted with said second carriage after said grippers pivot to the fully opened positions disengaged from said angled abutment surfaces.

4,512,845

APPARATUS FOR JOINING A PLURALITY OF SUPER-IMPOSED WEBS RECEIVED FROM A ROTARY PRINTING MACHINE

Ingo Köbler, Anhausen, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,201
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226907
Int. Cl.³ B42D 1/00
U.S. Cl. 156—548 20 Claims



1. For combination with a rotary printing machine delivering a plurality of continuously moving superimposed web portions (2a,2b),

apparatus for connecting said web portions at a folding line (19) extending transversely to the direction of movement of the web portions,

comprising means (3,4) receiving said web portions in superimposed condition and guiding said web portions in a first path,

deflection means (4) deflecting one (2b) of said web portions from superimposed position from the other (2a) and guiding said web portion in a separate path;

adhesive strip application roller means (7, 8; 21, 22; 25, 26) rotating at the speed of movement of the web portions for applying a strip of adhesive on said deflected web portion (2a) at the side thereof facing the other web portion;

adjustable register roller means (14) for guiding said deflected web portion in a predetermined path having a predetermined path length within said separate path;

guide roller means (6) located downstream of said register roller means (14) guiding said deflected web portion into contact with the undeflected web portion (2a), the path length of said path between said receiving means (3,4) and the guide roller means (5,6) of the deflected web portion (2b) being longer than the path length of the undeflected web portion (2a);

and a folding apparatus (16) folding said two again superimposed web portions at the folding line and insuring adhesion of the previously deflected web portion (2b) against the undeflected web portion (2a) by the adhesive on the adhesive strip at the folding line.

4,512,846

METHOD FOR GROWTH OF CRYSTALS BY PRESSURE REDUCTION OF SUPERCRITICAL OR SUBCRITICAL SOLUTION

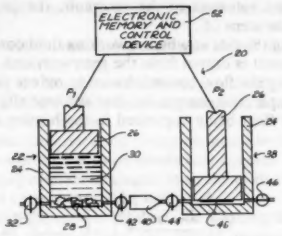
Paul J. Shlichta, San Pedro, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,944
Int. Cl.³ C30B 7/10
U.S. Cl. 156—623 Q 15 Claims

1. A process for growing a crystal, comprising:

dissolving at least a portion of a substance to be grown into

a crystal in a suitable fluid solvent at a high pressure to yield a solution and at or near the critical temperature, and



gradually decreasing the pressure of the solution while minimizing heat flow between the solution and its environment to produce a substantial increase in volume.

4,512,847

METHOD OF MEASURING THE THICKNESS OF THE REMOVED LAYER IN SUBTRACTIVE WORKPIECE PROCESSING

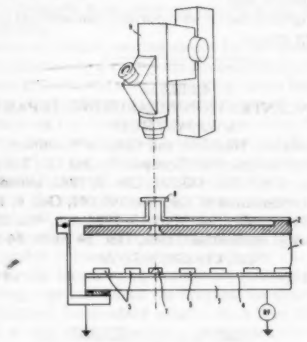
Arwed Brunsch, Stuttgart; Wolf-Dieter Ruh, and Gerhard Trippel, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,761

Claims priority, application European Pat. Off., Oct. 14, 1982, 82109514.8

Int. Cl.[3] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—626 **5 Claims**



1. The method of measuring the removed layer thickness is subtractive workpiece processing, said method comprising the steps of:

processing the workpiece simultaneously with a test sample consisting of the same material as the workpiece, the test sample consisting of a wedge and two covering pieces complementary to the two lateral surfaces of the wedge and protecting the surfaces against the processing;

measuring, in the plane of the surface formed by the wedge point and the covering pieces and exposed to processing, the respective distance x_1 between the two gaps which appear between the lateral surfaces of the wedge and the adjacent protecting pieces; and

determining the respectively removed layer thickness z_1 from the difference between the original distance x_0 and the measured distance x_1, taking into consideration the wedge angle α.

4,512,848

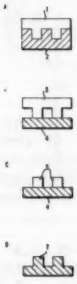
PROCEDURE FOR FABRICATION OF MICROSTRUCTURES OVER LARGE AREAS USING PHYSICAL REPLICATION

Harry W. Deckman, Clinton, and John H. Dunsmuir, Annandale, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 6, 1984, Ser. No. 577,174

Int. Cl.[3] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—630 **14 Claims**



1. A process for the negative or positive replication of microstructures from a master comprising:

(a) coating said master with a layer of film forming polymer material so as to form a negative replica of said microstructures of said master onto one surface of said polymer material, such that said polymer becomes solidified, said material being a single polymeric material;

(b) separating said single solidified layer of polymer material from said master;

(c) placing said single solidified layer of polymer material onto a surface of a substrate so as to form a lithographic mask; and

(d) transferring a pattern derived from said lithographic mask to said substrate by etching.

4,512,849

WET-LAID, NON-WOVEN FABRICS

Ralph E. Brandon, Monroe; Charles J. Davis, Goshen; Michael Ring, Warwick, and Roy S. Swenson, Central Valley, all of N.Y., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 89,611, Oct. 29, 1979, abandoned, which is a continuation of Ser. No. 786,590, Apr. 11, 1977, Pat. No. 4,200,488, which is a continuation of Ser. No. 551,399, Feb. 20, 1975, Pat. No. 4,049,491. This application Jun. 8, 1984, Ser. No. 618,325

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.[3] **D21H** *5/12*

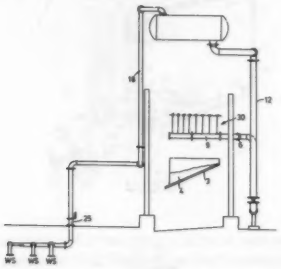
U.S. Cl. 162—157.2 **11 Claims**

1. A wet-laid non-woven fabric containing a binder which comprises at least 50% by weight of synthetic, hydrophobic fibers, having a length to diameter ratio of about 1000 to 3000 and a length of at least ¼ inch; which has a microvariation in basis weight of not more than about 10% and a macrovariation in basis weight of not more than about 5%; and which is essentially free of knits, bundles and strings.

4,512,850
PROCESS FOR WET QUENCHING OF COAL-COKE

Wilhelm Mosebach, Kamen-Methler, Fed. Rep. of Germany, assignor to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,397
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049157
Int. Cl.³ C10B *39/08, 41/00*
U.S. Cl. 201—1 **6 Claims**



1. A process for wet-quenching of coke to limit wasteful particulate emission of coke dust during quenching, the process being of the type wherein hot coke from a coke oven is hauled under a quenching hood of a quenching tower in a positioned open wet-quenching car, any vapors generated during quenching being discharged through a chimney at the top of the quenching hood, the process comprising:

supplying quenching water from a reservoir to sprinklers in at least two distinct stages, said quenching water being supplied in a predetermined quantity at a substantially constant pressure head;

sprinkling in an initial stage using a first set of nozzles directed at a maximum height of coke deposited in said quenching car, a first quantity of water which is substantially more than half of said predetermined quantity of water over the hot coke during a predetermined first time-interval so as to create a water vapor barrier across the quenching hood and to wash any generated particulate coke dust down; and

in a second stage, sprinkling a second quantity of water which is less than said first quantity of water, over the coke for a second time-interval which is substantially larger than the first time-interval, until the end of sprinkling,

said step of sprinkling in an initial stage being started before said wet-quenching car is completely positioned under said hood of said quenching tower.

4,512,851
PROCESS OF PURIFYING A RECIRCULATING WORKING FLUID

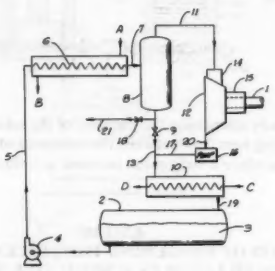
Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed Feb. 15, 1983, Ser. No. 466,430
Int. Cl.³ B01D *3/06, 3/42*; F01K *25/00, 27/00*
U.S. Cl. 203—88 **5 Claims**

1. A process for removing a less volatile minor contaminant from a volatile recirculating working fluid in a thermal power recovery system in which a pump draws the working fluid from a reservoir and pumps the working fluid under pressure through a heating means to vaporize the working fluid which then flows to a separating means where a portion of the working fluid not vaporized is collected and returned to the reservoir while the vaporized working fluid is delivered through a flow control device to an expansion engine where the working fluid expands and produces power which is transmitted to a shaft, the shaft having a seal to prevent contamination of the working fluid by a shaft contaminant, the resulting expanded vaporized working fluid flowing to a condenser where it is condensed and returned to the reservoir, the improvement comprising the steps of:

(a) reducing the rate at which a working fluid containing the contaminant is drawn from the reservoir; and

(b) adjusting the flow control device to reduce the pressure in the separating means, so that substantially all of the working fluid being vaporized in the heating means at a



temperature and a pressure corresponding to a temperature/pressure dew-point substantially above that of a sample of uncontaminated working fluid to form a vaporized working fluid and a residual unvaporized contaminant;

(c) collecting the residual unvaporized contaminant from the vaporized working fluid in the separating means;

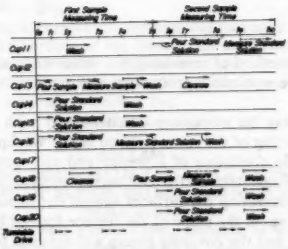
(d) passing the vaporized working fluid through the flow control device; and

(e) removing the residual unvaporized contaminant from the separating means.

4,512,852
IONIC CONCENTRATION MEASURING APPARATUS AND METHOD

Kosaku Tsuboshima, Hachioji, and Shigeru Yoshinari, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Continuation of Ser. No. 433,531, Oct. 8, 1982, abandoned, which is a continuation of Ser. No. 195,641, Oct. 9, 1980, abandoned. This application Mar. 13, 1984, Ser. No. 587,853
Claims priority, application Japan, Oct. 18, 1979, 54-133574
Int. Cl.³ G01N *27/28*
U.S. Cl. 204/1 T **14 Claims**



1. A method of measuring an ionic concentration of samples, comprising:

pouring a sample into a sample receiving cup;

pouring washing liquid into at least one washing liquid receiving cup;

pouring standard solution into a standard solution receiving

cup, each of said cups being disposed on a rotatable turntable;

measuring the ion concentration of the sample solution in said sample receiving cup with an ion measuring electrode means;

washing said ion measuring electrode means in said washing liquid receiving cups;

measuring the ion concentration of the standard solution in said standard solution receiving cup with said ion measuring electrode means;

wiping said ion measuring electrode means by bringing said ion measuring electrode means into contact with a liquid absorbing member contained in an electrode receiving cup carried by said turntable; and

discharging the sample solution, the washing liquid and the standard solution from the sample receiving cup, the washing liquid receiving cup and the standard solution cup, respectively, after these cups have passed through the ion measuring electrode means.

7. An apparatus for measuring ionic concentration of successive samples comprising a turntable adapted to rotate and stop at a predetermined timing, a plurality of measuring cups disposed about a circle on the turntable, ion sensitive electrode means provided at a measuring position and a control means for inserting and removing the electrode means into and out of the measuring cups in synchronization with the intermittent movement of the turntable, wherein the improvement comprises:

a sample pouring means for delivering successive samples into measuring cups, the sample pouring means located at a sample pouring position;

an electrode washing liquid pouring means for delivering an electrode washing liquid into measuring cups, the electrode washing liquid pouring means being located at a washing liquid pouring position;

electrode wiping means comprising a liquid absorbing member contained in an electrode receiving cup carried by the turntable;

a standard solution pouring means for delivering a standard solution having a known ion concentration into measuring cups, the standard solution pouring means being located at a standard solution pouring position; and

a measuring cup washing means for washing the measuring cups, the measuring cup washing means being located at a measuring cup washing means position which corresponds to a position upon the turntable;

wherein the control means for inserting and removing the electrode means into and out of the measuring cups in synchronization with the intermittent movement of the turntable is constructed to provide for the ion sensitive electrode means to be exclusively inserted into the measuring cups into which the samples, the electrode washing liquid and the standard solution have been delivered, with all of said means operating at substantially the same instant.

4,512,853
METHOD OF MONITORING PH

David B. Wright, and Brian D. Sharpe, Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

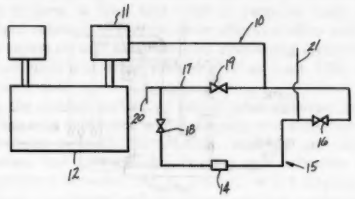
Continuation-in-part of Ser. No. 377,756, May 18, 1982,. This application May 17, 1983, Ser. No. 495,219
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—1 T 12 Claims

1. A method of electrometrically monitoring the pH of the cell electrolyte in a chloralkali electrolytic cell with a pH sensor initially moistened by a wetting solution, the pH sensor further having a reference electrode with a porous polytetrafluoroethylene membrane comprising the steps of:

(a) placing the pH sensor in an electrolyte flow stream so that the membrane is constantly wetted with electrolyte;

(b) using the cell electrolyte as the reference electrolyte by having the wetting solution replaced by diffusion of the cell electrolyte into the membrane during an acclimation period;

(c) connecting the pH sensor to a potential measuring instrument;



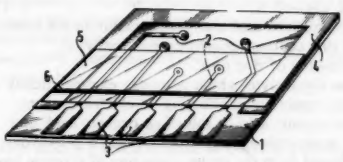
(d) leaving the pH sensor ungrounded; and

(e) letting the reference electrode fluctuate with the electrical potential of the electrolyte flow stream.

4,512,854
METHOD OF ELECTROPLATING PRINTED CIRCUITS

Klaus Grah, Solingen, Fed. Rep. of Germany, assignor to Beiersdorf AG, Hamburg, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 546,217
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240387
Int. Cl.³ C25D *5/02*
U.S. Cl. 204—15 6 Claims



1. In a process for electroplating a printed circuit board, the improvement comprising partially covering the surfaces of said printed circuit board with a masking tape, said masking tape comprising

(a) a foil-like carrier;

(b) a coating consisting of an adhesive material applied to one side of the foil-like carrier;

(c) at least one electrical conductor arranged on the coating of the masking tape and forming a unit therewith, said electrical conductor consisting of a mixture of varnish and metal powder; and

(d) a frame carried by the printed circuit board, said electrical conductor connecting the surfaces to be electroplated of the printed circuit board with one another and with the frame carried by the printed circuit board.

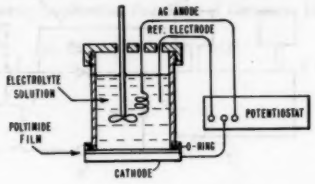
4,512,855
DEPOSITION OF METALS AS INTERLAYERS WITHIN ORGANIC POLYMERIC FILMS

Stephen Mazur, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1984, Ser. No. 633,502
Int. Cl.³ C25D *7/00*
U.S. Cl. 204—22 34 Claims

1. Metal interlayer deposition process by means of which a metal is deposited in its zero-valent state in a spatially-controlled manner within an organic polymeric film having first and second surfaces, the process comprising supplying ions of the metal to at least a part of the first surface and electrons to

at least a part of the second surface, the metal ions being in a positive oxidation state and in a coordination state such that they are mobile within the polymeric film and are transported through the film in a general direction toward the second



surface, the polymeric film being capable of accepting electrons in a reversible manner at the second surface, and the electrons being mobile within the polymeric film and being transported through the film in a general direction toward the first surface.

4,512,856

ZINC PLATING SOLUTIONS AND METHOD UTILIZING ETHOXYLATED/PROPOXYLATED POLYHYDRIC ALCOHOLS

Vincent Paneccasio, Madison, Conn., assignor to Enthone, Incorporated, New Haven, Conn.

Continuation of Ser. No. 253,657, Apr. 13, 1981, abandoned, which is a continuation of Ser. No. 95,483, Nov. 19, 1979, abandoned. This application May 25, 1984, Ser. No. 614,693

Int. Cl.³ C25D *3/22*

U.S. Cl. 204—55 R **17 Claims**

1. An aqueous, acid zinc plating solution for electrodeposition of zinc coatings consisting essentially of:

(a) a source of zinc ions;

(b) an electrolyte which provides electrolytically charged ions capable of conducting an electric current;

(c) an organic acid or salt of an organic acid; and

(d) a grain refining agent comprising a polyhydric alcohol selected from the group consisting of glycerin having 5 to 30 moles of ethylene oxide substituted for hydroxyl groups, glycerin having 3 to 15 moles of propylene oxide substituted for hydroxyl groups, sorbitol having 6 to 100 moles of ethylene oxide substituted for hydroxyl groups, or sorbitol having 1 to 20 moles of propylene oxide substituted for hydroxyl groups.

4,512,857

PREVENTION OF CORROSION OF ELECTROLYTE CELL COMPONENTS

Ronald D. Chamberlin, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1982, Ser. No. 444,116

Int. Cl.³ C25B *1/34;* **C23F** *13/00*

U.S. Cl. 204—98 **8 Claims**

1. In a method of operating an electrolytic cell for the production of chlorine and aqueous alkali metal hydroxide by the electrolysis of an aqueous alkali metal halide having an anode, a cathode with an electrolyte permeable diaphragm or an electrolyte impermeable but cation permeable permionic membrane therebetween and a structure with exposed iron in the cell's catholyte compartment, said cathode and said exposed iron being in contact with the strongly alkaline catholyte liquid of the cell, and said cathode comprising a catalyst having a lower electronegativity than the said exposed iron, the improvement comprising maintaining a sacrificial anode of a metal more galvanically reactive under cell conditions than said exposed iron in proximity to the exposed iron while electrolyzing said alkali metal halide to reduce dissolution of the exposed iron into the catholyte liquor.

4,512,858

METHOD OF PRODUCING AN ELECTRODE USABLE AS A FLOW-THROUGH ANODE

Bernd D. Struck, Langerwehe; Francisco J. Dias, Jülich; Hartmut Luhleich, Düren, and Ursula Paffen nee Siebert, Würselen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,654

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305753

Int. Cl.³ C25B *1/22*

U.S. Cl. 204—104 **6 Claims**

5. Method of anodic oxidation of sulfur dioxide in an electrolytic cell, having anode and cathode electrodes, comprising the steps of:

preparing the anode electrode by coating an electrode body of graphite-like carbon material with a layer of cokable organic material selected from the group consisting of sugars, phenolic resins and asphalt pitch;

heating the coated electrode body in an inert atmosphere to a temperature in the range from 400° to 800° C., thereby coking said layer, and

directly thereafter heating said coated electrode to a temperature in the range from 1400° to 2000° C., followed by cooling;

then placing the cooled coated and heat treated electrode in said electrolysis cell, together with an aqueous electrolyte in said cell, having 30 wt. % to 50 wt. % sulfuric acid with an addition of 0.005 wt. % to 1 wt. % of hydrogen iodide, sulfur dioxide being provided to said electrolyte at a partial pressure of at least 0.1 bar and a temperature in the range between 80° and 120° C., while a current density of at least 100 mA/cm^2 is passed through said cell for anodic oxidation of said sulfur dioxide.

4,512,859

ABRASIVE POLISHING METHOD

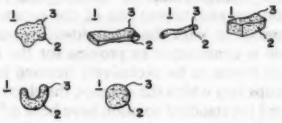
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Dec. 27, 1982, Ser. No. 453,174

Claims priority, application Japan, Dec. 26, 1981, 56-214389

Int. Cl.³ B24B *7/00*

U.S. Cl. 204—129.46 **16 Claims**



10. The method defined in claim 1 wherein said aggregate is of a predetermined quantity.

11. The method defined in claim 1 wherein said matrix consists at least in part of a synthetic or natural rubber.

4,512,860

CATHODIC ELECTROCOATING COMPOSITION COMPOUNDED WITH LATEX BINDER

Kirk J. Abbey, Cleveland, Ohio; James R. Erickson, Katy, Tex., and Barbara L. Kunz, Bay Village, Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jul. 14, 1983, Ser. No. 513,621

Int. Cl.³ C25D *13/06, 13/24*

U.S. Cl. 204—181 C **12 Claims**

1. In a method for electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode, an anode, and an aqueous electrodepositable composition wherein net unidirectional electric current is

passed through said circuit for causing deposition of said composition on said cathode, the improvement which comprises using as said composition an aqueous suspension of cationactive, film-forming, amino-stabilized synthetic latex binder particles characterized by being practically free of amino monomers and amino initiator fragments and containing not substantially more than about 15% low molecular weight material including solvents based on the latex solids content.

3. A process for improving the electrodeposition of film-forming, cation-active, amino-stabilized synthetic latex which comprises removing therefrom cation-active low molecular weight material by contacting an aqueous dispersion of said latex with ion exchange resin in acid form.

4,512,861

ELECTROPHORETIC COATING PROCESS

Andrew Doroszkowski, Marlow, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 289,236, Aug. 3, 1981, abandoned, which is a continuation of Ser. No. 122,818, Feb. 19, 1980, abandoned. This application Dec. 30, 1983, Ser. No. 567,371

Claims priority, application United Kingdom, Feb. 27, 1979, 7906828

Int. Cl.³ C25D *13/10*

U.S. Cl. 204—181 R **8 Claims**

1. In a process of coating an electrically conductive substrate with a film-forming material wherein the substrate is immersed as an anode in a dispersion of the film-forming material in an aqueous medium and an electrical current is passed between the anodic substrate and a counter-electrode in electrical contact with the dispersion for a sufficient period of time to form a coating of desired thickness, the improvement characterised in that:

(a) the film-forming material is stabilised in the aqueous medium at a pH of greater than 3.9 by non-ionic stabilisation,

(b) the film-forming material is substantially free from ionic charges or contains and/or is associated with only an amount of ionic charges such as will not alone primarily determine the stability of the dispersion, and

(c) the dispersion also contains a chemical moiety, which is present in a further material constituent of the dispersion and/or in the film-forming material, which moiety is interactive with a non-ionic hydrophilic moiety providing the non-ionic stabilisation of the dispersion of film-forming material, the interaction between the moieties causing destabilisation and flocculation or precipitation of the dispersed film-forming material at a pH of 3.9 or less.

4,512,862

METHOD OF MAKING A THIN FILM INSULATOR

Eugene B. Rigby, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 8, 1983, Ser. No. 520,963

Int. Cl.³ B05D *5/12*

U.S. Cl. 204—192 D **6 Claims**

1. A process for forming a thin insulative coating on a substrate having an electrical surface charge in an acidic solution comprising the steps of:

preparing an up to 5% by weight silica solution containing particles of SiO_2 in the range between 50 Å and 400 Å, said solution having a pH in the range between 2 and 5 and a first charge;

preparing an approximately 1% by weight alumina solution containing alumina particles of approximately 50 Å size, said alumina solution having a pH in the range between 2 and 5 and a second charge opposite to said first charge;

dipping said substrate into the one of said solutions having a charge opposite to said surface charge and, thereafter, alternately dipping said substrate into said prepared solutions to form at least one layer of particles from each charged solution to thereby form alternate silica and alumina layers on said substrate, said alternating layers being formed until a coating thickness of at least 1000 Å is obtained; and

sealing the coated surface of said dipped substrate by (a) heating said substrate, or (b) dipping said substrate in a hydrolized orthosilicate solution, washing said dipped substrate and subsequently heating said substrate to a temperature between 250° to 350° C., or (c) dipping said substrate in a heated sodium silicate solution, washing said dipped substrate and subsequently heating said substrate.

6. A process as defined in claim 1, 2, 3 or 4 further comprising the step of sputtering an alumina layer over said sealed surface of said substrate.

4,512,863

STAINLESS STEEL PRIMER FOR SPUTTERED FILMS

Russell C. Criss, Pittsburgh, and F. Howard Gillery, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 9, 1983, Ser. No. 530,553

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **14 Claims**

1. A method for coating a nonmetallic substrate with a film by cathode sputtering, wherein the film comprises a metal characterized by low adhesion to the substrate surface, comprising the steps of:

a. first depositing onto the substrate surface a primer layer of a metal which bonds oxidatively to the nonmetallic substrate surface; and

b. subsequently sputtering the low adhesion metal film onto the primer layer.

4,512,864

LOW RESISTANCE INDIUM OXIDE FILMS

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 30, 1983, Ser. No. 556,657

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 P **9 Claims**

1. In a method for sputtering a metal oxide containing film onto a substrate surface from a cathode comprising a metal selected from the group consisting of indium, tin and mixtures thereof, in which a magnetic field is formed adjacent the cathode sputtering surface, the improvement which comprises maintaining the substrate at a temperature sufficiently higher than the ambient temperature during sputtering to produce a metal oxide containing film with a resistance significantly lower than that of a film similarly deposited on a substrate at ambient temperature.

4,512,865

ELECTROLYTIC STERILIZER FOR CONTACT LENSES

Masakatu Yamauchi, Kani, Japan, assignor to Tanica Electric Co., Ltd., Tajimi and Tomei Sangyo Kabushiki Kaisha, Nagoya, both of, Japan

Filed Jun. 6, 1984, Ser. No. 617,815

Int. Cl.³ C25B *9/00*

U.S. Cl. 204—271 **2 Claims**

1. An electrolytic sterilizer for contact lenses, said sterilizer comprising:

(a) a main body accomodating a power source unit, said main body having a recess in the upper surface thereof;

(b) a pair of protrusions made of an electrically insulating material protruding upwardly from the bottom of said recess, said pair of protrusions defining a groove in the

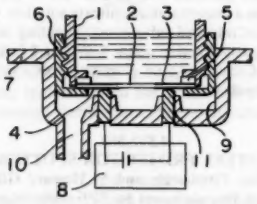
bottom of said recess which receives waste sterilizer solution accidentally spilled into said recess in said main body;

(c) a sterilizer container detachably mountable in said recess in said main body;

(d) a pair of electrolytic electrodes for conducting an electric current in said sterilizer container;

(e) a pair of sterilizing container contacts in electrical contact with said pair of electrolytic electrodes; and

(f) a pair of main body contacts in electrical contact with said power source unit, said pair of main body contacts being mounted in and protruding upwardly from said pair of protrusions and being positioned to make electrical



contact with said pair of sterilizer container contacts when said sterilizer container is mounted in said recess in said main body, whereby:

(g) the portions of said pair of main body contacts which come into contact with said pair of sterilizer container contacts are normally above the level of waste sterilizer solution accidentally spilled into said recess in said main body and

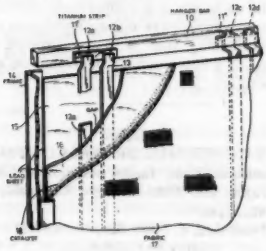
(h) said pair of protrusions made from an electrically insulating material normally prevent electrolysis from occurring in waste sterilizer solution accidentally spilled into said recess in said main body.

4,512,866

TITANIUM-LEAD ANODE FOR USE IN ELECTROLYTIC PROCESSES EMPLOYING SULFURIC ACID

Robert C. Langley, 214 Old Forge Rd., Millington, N.J. 07946

Filed Oct. 4, 1983, Ser. No. 538,799
Int. Cl.³ C25B *11/00*
U.S. Cl. 204—290 F **6 Claims**



1. An anode for use in electrolytic processes with an electrolyte containing sulfuric acid which comprises:

(a) a valve metal substrate;

(b) a lead or lead alloy antipassivation layer in contact with said valve metal substrate; and

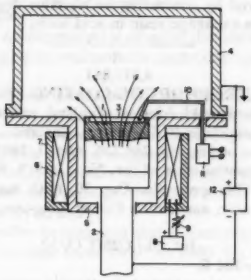
(c) a lead ruthenate or lead iridate catalyst in surface contact with the lead or the lead alloy.

4,512,867

METHOD AND APPARATUS FOR CONTROLLING PLASMA GENERATION IN VAPOR DEPOSITION

Anatoly A. Andreev, ulitsa Danilevskogo, 31, kv. 47, and Anatoly A. Romanov, ulitsa Valtera, 7, kv. 135, both of Kharkov, U.S.S.R.

Continuation of Ser. No. 324,537, Nov. 24, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,382
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **11 Claims**



1. An apparatus for vapor deposition coating in which a plasma of coating material is generated from the surface of an electrode, said apparatus comprising:

(a) a sacrificial metal cathode having a plasma generating and face containing a depression whose bottom defines the plasma generating surface, so that cathode spots which are created on the generating surface are prevented from moving to the periphery of said end face;

(b) means for generating a plasma from said cathode;

(c) means for producing an electromagnetic field adjacent said plasma generating surface comprising a magnetic wire coil placed coaxially with said cathode and below the level of the plasma generating surface, so that the lines of force of said electromagnetic field extend in an inclined position with respect to the periphery of the plasma generating surface to influence the movement of the cathode spots on said plasma generating surface; and

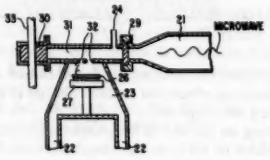
(d) means for altering the intensity of the electromagnetic field to selectively control the size of the portion of the cathode from which the plasma is generated, so that a uniform distribution of paths of movement of said cathode spots on said plasma generating surface is provided.

4,512,868

MICROWAVE PLASMA PROCESSING APPARATUS

Shuzo Fujimura, Tokyo, and Hiroshi Yano, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 9, 1984, Ser. No. 628,863
Claims priority, application Japan, Jul. 8, 1983, 58-124511
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **8 Claims**



1. A plasma processing apparatus for semiconductor substrates comprising:

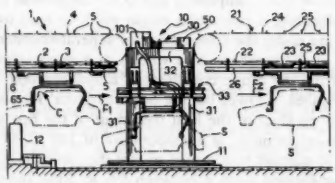
a microwave power source;
a microwave transmitting means including a waveguide;
a plasma generating region defined in a part of said waveguide;
a reacting region for processing a semiconductor substrate, coupled to said plasma generating region;
a dielectric window formed in said waveguide for defining a portion of said plasma generating region, said dielectric window transmitting microwave power;
a gas inlet through which the reactive gas is fed into said plasma generating region wherein free radicals of the reactive gas are generated in the plasma; and
radical transmitting means provided between said plasma generating region and said reacting region, said radical transmitting means transmitting the free radicals created in said plasma generating region into said reacting region and substantially preventing the leak of microwave energy and the plasma into the reacting region, wherein the free radicals act on the semiconductor substrate in said reacting region.

4,512,869

OVERHEAD CONVEYOR INSTALLATION FOR MOTOR VEHICLE BODIES PARTICULARLY FOR ELECTROPHORESIS PAINT LINES, AND A BODY CARRIER USABLE IN THIS INSTALLATION

Vitale Boccalatte, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 15, 1984, Ser. No. 610,411
Claims priority, application Italy, May 19, 1983, 67556 A/83
Int. Cl.³ B65G *49/02*; C25D *13/04, 13/12*
U.S. Cl. 204—300 EC **7 Claims**



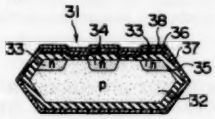
1. A body carrier for an overhead conveyor installation, said body carrier being arranged to carry a motor vehicle body having windshield and rear window apertures and internal engagement apertures, the body carrier comprising:
at least one trolley,
a support structure carried by said at least one trolley and arranged to receive and convey a motor vehicle body, said structure having front suspension means and rear suspension means for introduction into said body through said windshield and rear window apertures respectively and for engagement in said internal engagement apertures in the body;
at least one electrical contact member carried by the said structure and connectible to said body to allow connection of the body to an electric voltage source;
first locking means for simulaneously locking the said front suspension means and the said at least one electrical contact member respectively in an engaged position and in a position of contact with said body; and
second locking means for locking the said rear suspension means in an engaged position in the said body.

4,512,870

CHEMICALLY SENSITIVE ELEMENT

Satsuki Kohara, Koganei, and Noriaki Ono, Akishima, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Dec. 2, 1983, Ser. No. 557,610
Claims priority, application Japan, Dec. 6, 1982, 57-213693
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—416 **4 Claims**



1. A chemically sensitive element of the ion sensing field-effect transistor type including a semiconductor substrate having source, drain and channel regions; a gate insulating membrane disposed atop said channel region; an optically opaque membrane disposed atop said gate insulating membrane; a protecting membrane disposed atop said optically opaque membrane; and an ion sensing membrane disposed atop said protecting membrane.

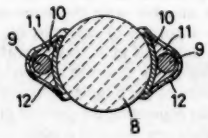
3. A chemically sensitive element of the ion sensing field-effect transistor type including a semiconductor substrate having an upper surface and source, drain and channel regions defined at said upper surface; a gate insulating membrane disposed atop said channel region; a protective membrane disposed atop said gate insulating membrane; an optically opaque membrane disposed atop said protective membrane and being at least coextensive with said upper surface; and an ion sensing membrane disposed atop said optically opaque membrane.

4,512,871

OXYGEN SENSOR WITH HEATER

Nobuhide Kato, Aichi, and Takao Murase, Konan, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 27, 1984, Ser. No. 604,473
Claims priority, application Japan, May 9, 1983, 58-68663[U]; May 9, 1983, 58-68664[U]; Dec. 23, 1983, 58-202830[U]; Dec. 23, 1983, 58-202831[U]
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—429 **15 Claims**



1. An oxygen sensor comprising:
a tubular solid electrolyte body having an elongate bore which is closed at one end of said tubular solid electrolyte body and open at the other end, and further having reference and measuring electrodes on inner and outer surfaces thereof, respectively;
a housing supporting said tubular solid electrolyte body such that said outer surface thereof is exposed at said one end to exhaust gas, said housing maintaining said elongate bore in gas-tight condition with respect to said exhaust gas; and
a bar-shaped heater inserted in said elongate bore in said tubular solid electrolyte body, and comprising a heating resistor having a positive temperature coefficient, a ceramic body carrying said heating resistor so as to embed the heating resistor, and a pair of lead wires for connecting said heating resistor to an electric power source,

said ceramic body having on its outer peripheral surface a pair of terminal pads connected to said heating resistor, an end portion of each of said lead wires being brazed to corresponding one of said terminal pads with a mass of brazing material containing silver, an exposed surface of said mass of brazing material being coated with a metallic layer made of metal which is different from silver or its alloy.

4,512,872

PROCESS FOR EXTRACTING BITUMEN FROM TAR SANDS

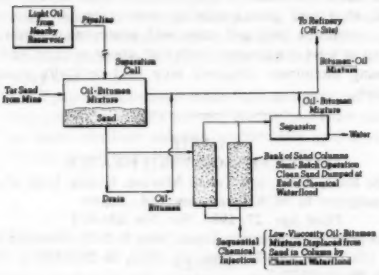
Harold S. Chung, Dallas, Tex., and Joseph J. Dickert, Jr., Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 495,568, May 18, 1983, Pat. No. 4,457,827, which is a continuation-in-part of Ser. No. 242,217, Mar. 10, 1981, abandoned. This application Feb. 16, 1984, Ser. No. 580,927

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE **9 Claims**



1. A process for the recovery of bitumen from mined tar sands that comprises the steps of:

(i) admixing mined tar sands with a liquid hydrocarbon which is miscible with the bitumen in said tar sands, whereby a portion of said miscible liquid hydrocarbon becomes dissolved in at least a portion of said bitumen, thereby becoming absorbed on said tar sand and reducing the viscosity of the bitumen remaining thereon;

(ii) essentially separating the mixture of step (i) into a liquid hydrocarbon portion and a solid tar sand portion, said solid tar sand portion containing bitumen of reduced viscosity; and

(iii) while maintaining said separated tar sand portion of step (ii) in an essentially fixed bed state in one or more columns, injecting into one end of said column or columns an aqueous chemical waterflooding composition comprising water and at least one chemical waterflooding additive selected from the group consisting of surfactants, viscosifying additives and mixtures thereof, whereby said waterflooding composition passes through said column or columns in a manner such that the tar sands in said column or columns are maintained in a fixed bed state with the substantial absence of agitation of the tar sand particles, and bitumen on said tar sand is displaced therefrom and is passed along with said waterflooding composition to the end of said column or columns opposite the point of injection.

4,512,873

PROCESS FOR LOW TEMPERATURE CARBONIZATION OF HYDROGENATION RESIDUES

Gert Escher, Gelsenkirchen; Rolf Holighaus, Julich, and Hans-Peter Wenning, Dorsten-Rhade, all of Fed. Rep. of Germany, assignors to Veba Oel Entwicklungs-Gesellschaft mbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,792

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300365

Int. Cl.³ C10G *1/06, 1/00, 17/00*

U.S. Cl. 208—13 **10 Claims**

1. In a process for the low temperature carbonization of residues obtained from the hydrogenation of oil or of coil in a heated rotary drum at temperatures between approximately 400° C. and 600° C.;

the improvement comprising introducing as the major source of heat a hot gas into said low temperature carbonization drum; wherein carbonization gas is employed as said hot gas after the separation of the condensable portions thereof; and

wherein said gas has been heated to temperatures between approximately 600° C. and approximately 950° C.

4,512,874

METHOD FOR PRODUCING MESOPHASE CONTINUOUSLY

Masami Watanabe, Tokyo, Japan, assignor to Kashima Oil Company Limited, Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,587

Int. Cl.³ C10C *3/00;* D01F *9/14*

U.S. Cl. 208—44 **1 Claim**

1. A method for continuously producing 100% mesophase having a softening point of about 209° to about 246° C. composed only of Q.I. Component and Q.S. Component comprising (i) subjecting a petroleum origin pitch to heat treatment with stirring under the atmospheric or superatmospheric pressure and in the presence of a stream of a non-oxidative gas selected from the group consisting of a hydrocarbon of small carbon number, a lower boiling point naphtha fraction and a dry gas by-product of the heat treatment of the raw material petroleum-origin pitch, at a temperature of 360° C. to 450° C. for from 30 minutes to 30 hours so that the mesophase content in the heat-formed pitch is between 5% to 50%, (ii) continuously transferring a predetermined amount of the heat-treated pitch from the heat-treatment step to a mesophase growing and coalescing step, (iii) heating the transferred heat-treated pitch in the mesophase growing and coalescing step to cause only the mesophase to grow and coalesce by aging under the atmospheric or superatmospheric pressure and in the presence or absence of a stream of the non-oxidative gas at a temperature higher than 280° C. and lower than 350° C. for from 5 to 30 hours, so as to separate the heat-treated pitch into an upper layer of a non-mesophase pitch and a lower layer of a mesophase pitch and (iv) continuously removing a 100% mesophase composed of Q.I. component and Q.S. component from the lower layer in the growing and coalescing step; and simultaneously and continuously removing non-mesophase pitch from the upper layer of the growing and coalescing step, in an amount corresponding to a predetermined amount of the heat-formed pitch transferred to the growing and coalescing step minus the amount of 100% mesophase continuously removed, and (v) adding new raw material pitch in an amount necessary to produce the amount of 100% mesophase continuously removed.

4,512,875
CRACKING OF CRUDE OILS WITH CARBON-HYDROGEN FRAGMENTATION COMPOUNDS OVER NON-ZEOLITIC CATALYSTS

Gary N. Long, Putnam Valley; Regis J. Pellet, Croton-On-Hudson, and Jule A. Rabo, Armonk, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 2, 1983, Ser. No. 490,952
Int. Cl.³ C10G *11/04*
U.S. Cl. 208—114 **14 Claims**

1. The process for conversion of a crude oil feed comprising:

(a) combining the crude oil feed with between about 1 weight percent and about 25 weight percent, based on total feed weight, of a carbon-hydrogen fragmentation compound selected from the group consisting of alcohols, acetals, aldehydes, ketones, aliphatic ethers, olefins, napthenes, paraffins containing from about 13.0 to about 25 percent by weight hydrogen and mixtures thereof; and

(b) contacting the combined product of step (a) at effective catalytic cracking conditions with a catalyst comprising at least one non-zeolitic moleoular sieve selected from the group consisting of:

(1) microporous crystalline silicoaluminophosphate having a unit empirical formula in the as-synthesized and anhydrous form of:

$$mR:(Si_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" has a value of from zero to 0.3: "m" represents the moles of "R" present per mole of $(Si_xAl_yP_z)O_2$; "x", "y" and "z" represent the mole fractions of silicon, aluminum and phosphorus respectively, present as tetrahedral units, said mole fractions being such that they are within the pentaqonal compositional area defined by points A,B,C,D and E of the ternary diagram which is FIG. 1 of the drawings; and

(2) aluminophosphates having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is:

$$Al_2O_3:1.0\pm0.2\ P_2O_5$$

each of said framework structures being microporous in which the pores are uniform and have nominal diameters within the range of about 3 to about 10 Angstroms, an intracrystalline adsorption capacity for water at 4.6 torr and 24° C. of at least 3.5 weight percent, the adsorption and desorption of water being completely reversible while retaining the same essential framework topology in both the hydrated and dehydrated state.

4,512,876
CATALYSIS OVER ACTIVATED HIGH SILICA ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,418, Mar. 8, 1982, Pat. No. 4,427,786. This application Nov. 16, 1983, Ser. No. 552,545
Int. Cl.³ C10G *11/05, 11/08, 45/54*
U.S. Cl. 208—114 **16 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feed stock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a supported crystalline zeolite having an initial silica-to-alumina mole ratio greater than about 100 prepared by a method which comprises compositing said crystalline zeolite with a support matrix material of alumina, gallia or a combination thereof, calcining the resulting supported zeolite at a temperature of from about 200° C. to about 600° C. for a period of time ranging from about 1 minute to about 48 hours, contacting said calcined supported zeolite with volatile boron fluoride in a dry environment at a temperature of from about 0° C. to about 100° C. until said supported zeolite is saturated with said boron fluoride, purging unreacted boron fluoride from said boron fluoride contacted supported zeolite, hydrolyzing said boron fluoride contacted supported zeolite, and converting said hydrolyzed material to hydrogen form.

4,512,877
PROCESS FOR IMPROVING THE QUALITY OF CATALYTICALLY CRACKED GASOLINE

Eduard P. Kieffer, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 11, 1984, Ser. No. 629,871
Claims priority, application Netherlands, Jul. 14, 1983, 8302520
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—136 **14 Claims**

1. A process for improving the quality of a gasoliine produced by catalytic cracking, characterized in that the gasoline is contacted with a mixture of two catalysts, one of which is a zinc-containing composition which, in addition to zinc, comprises chromium and/or aluminum, and which composition has been prepared starting from one or more precipitates obtained by adding a basic reacting substance to one or more aqueous solutions containing salts of the metals involved, the other being a crystalline metal silicate which, after one hour's calcination in air at 500° C. has the following properties:

(a) an X-ray powder diffraction pattern in which the strongest lines are the four lines mentioned in Table A,

TABLE A

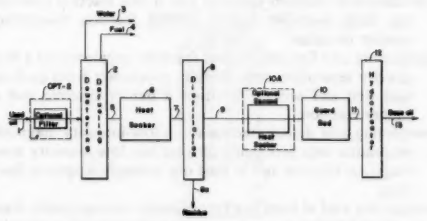
d (Å)
11.1 ± 0.2
10.0 ± 0.2
3.84 ± 0.07
3.72 ± 0.06, and

(b) a composition which, in addition to SiO_2, includes Fe_2O_3 or both Fe_2O_3, and in which the $SiO_2/(Fe_2O_3+Al_2O_3)$ molar ratio is higher than 10, the SiO_2/Fe_2O_3 molar ratio is lower than 250 and the SiO_2/Al_2O_3 molar ratio is at least 500.

4,512,878
USED OIL RE-REFINING

Lloyd E. Reid; Keith C. Yao, both of Sarnia, Canada, and Douglas G. Ryan, Rockaway, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 16, 1983, Ser. No. 467,032
Int. Cl.³ C10M *11/00;* C10G *45/00*
U.S. Cl. 208—179 **11 Claims**



1. A process for re-refining used oils so as to produce a basestock oil essentially equivalent in quality to basestock

produced from virgin crude oil which process comprises the steps of:

(A) heat soaking the used oil at from 250° C.-340° C. for a time sufficient to maximize halide, phosphorus and sludge precursors removal by conversion of these materials into materials which go with the residue during the distillation step;

(B) passing the entire contents of the heat soaker directly to coke resistant distillation means;

(C) distilling the contents from the heat soaker under conditions of residence time, temperature and pressure selected to produce a distillate whose end point is essentially that of the target stock product and a residue;

(D) passing the distillate through a guard bed of activated material capable of removing residual phosphorus, halides and sludge from the distillate;

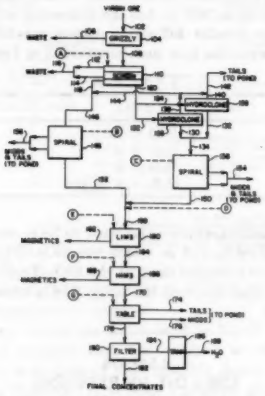
(E) hydrotreating the guard bed treated distillate under standard hydrotreating conditions, thereby producing a re-refined base stock.

4,512,879

PROCESS FOR PRODUCING A METALLIFEROUS CONCENTRATE FROM A PARTICULATE FEED MATERIAL

Yosry A. Attia, and Ted L. Tewksbury, both of Columbus, Ohio, assignors to Battelle Development Corp., Columbus, Ohio

Filed Jul. 20, 1983, Ser. No. 515,574
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—3 **6 Claims**



1. A process for producing a metalliferous concentrate from particles of varying sizes, said process comprising:

subjecting said particles to a preliminary separation step in which only particles smaller than about 10 mesh are retained;

dividing said retained particles into a first fraction containing large particles and a second fraction containing smaller particles;

subjecting said first and second fractions separately to a first gravity separation step, thereby producing from each of said first and second fractions a denser fraction and a lighter fraction;

subjecting said denser fractions to a low-intensity magnetic separation step producing at least one low-intensity non-magnetic fraction and at least one strongly magnetic fraction;

subjecting said at least one low-intensity non-magnetic fraction to a high-intensity magnetic separation step, thereby producing at least one non-magnetic fraction and a weakly magnetic fraction; and

subjecting said at least one non-magnetic fraction to a second gravity separation step, thereby separating a denser fraction to form said metalliferous concentrate.

4,512,880

METHOD OF REMOVING SLIMES FROM SLURRIES

James D. Connolly, P.O. Box 1238, Princeton, W. Va. 24740

Filed Apr. 28, 1983, Ser. No. 489,491
Int. Cl.³ B07B *1/04*; B01D *35/22*
U.S. Cl. 209—250 **3 Claims**

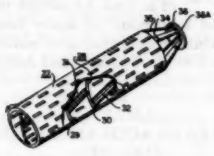
1. A method of removing slimes from a low solids content slime-containing liquid-solids mixture using without blinding a screen having a longitudinally dowhwardly sloping screen surface formed of laterally spaced transverse profile screen wires, comprising pressure feeding said mixture to said screen surface longitudinally of and at an acute impact angle relative to said surface at a pressure which, for the slime content and impact angle of the mixture, over the area of impact will drive liquid and contained slimes through and beyond a back of the screen for gravity discharge out of contact with said back.

4,512,881

MACHINE FOR RECOVERING PRECIOUS METAL VALUES FROM ORE

Merwin S. Shumway, 558 W. 400 North, and Earl D. Shumway, P.O. Box 237, both of Blanding, Utah 84511

Filed Sep. 30, 1983, Ser. No. 537,743
Int. Cl.³ B03B *5/56*
U.S. Cl. 209—270 **1 Claim**



1. A machine for processing ore to recover precious metal values, said machine including, in combination: an elongate, hollow drum having a series of perforations essentially from end to end; means for introducing water in said drum; means for supporting said drum for axial rotation; means for revolving said drum coupled thereto; elongate means having a reservoir-constructed lowered end and disposed beneath said drum for receiving ore and water droppings from said drum as fall through said perforations; auger means spacedly disposed proximate to and above said receiving means for advancing a portion of said droppings along and out said receiving means away from said lowered end, whereby to leave such precious metal values as exist in said ore, as is so processed by said machine, beneath said auger means and at said reservoir- con-

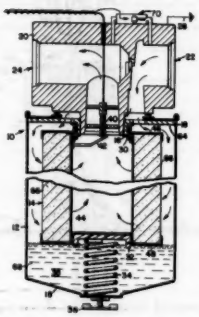
structed lowered end of said receiving means, available for discharge recovery; means coupled to said auger means for operationally revolving the same; and means for withdrawing said values coupled to said reservoir constructed lowered end at a lower portion thereof, and wherein said drum has a feed hopper at one end and also a series of mutually spaced conically-arranged bars affixed to the remaining end, and means joining said bars together.

4,512,882

SINGLE-ENDED, SPIN-ON FUEL WATER SEPARATOR

Paul M. Fischer, Menomonie, Wis., and Carl E. Schwarz, Burnsville, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 18, 1983, Ser. No. 543,060
Int. Cl.³ B01D *35/18*
U.S. Cl. 210—86 **8 Claims**



1. A fuel-water separator having a spin-on filter cartridge, said cartridge having a filter element attached at a first and a second surface within an electrically grounded housing, said housing including a separated water reservoir, said separator comprising:

means supplying an electrical potential from a power source to said filter element;

means for insulating said filter element from said housing, said insulating means located at said first and said second surfaces of attachment of said filter element to said housing;

means indicating a current flow through separated water within said reservoir between said filter and said housing;

a head, including means for supplying a mixture of fuel and water into said separator, upstream from said filter element;

means for discharging separated fuel from said separator downstream from said filter element, said head threadably engaging said spin-on filter cartridge, said discharging means including a passageway having an electrical contact affixedly suspended within said passageway, said contact insulated from said head and electrically connected to said power source; and

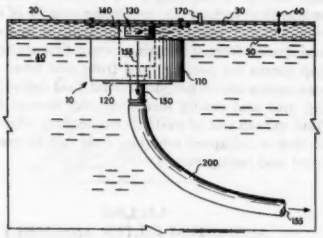
means for electrically connecting said filter element and said electrical contact when said filter cartridge is threadably engaged to said head, said electrically connecting means including a spring arm having a contact point, said arm affixed to said filter element near said first surface of attachment of said filter element to said housing, said spring arm extending into said passageway and contacting said electrical contact.

4,512,883

SKIMMER FOR FLOATING ROOF TANKS

Timothy J. Thompson, Detroit, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 449,951, Dec. 15, 1982, Pat. No. 4,431,536. This application Aug. 15, 1983, Ser. No. 523,241
The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.
Int. Cl.³ B03B *5/28*
U.S. Cl. 210—123 **7 Claims**



1. A skinner (10) for a floating roof tank (300), said floating roof tank (300) holding a mixture comprised of at least two immiscible liquids including a lowest specific gravity liquid (50) and at least one higher specific gravity liquid (40) with the roof (30) of said tank (300) floating on said mixture, said skimmer comprising:

a funnel (140) attached to the underside (20) of said roof (30), said funnel (140) extending downwardly into said liquid mixture (40, 50), said funnel (140) having formed perforations (130) near said attachment to said underside (20),

a float (110) operatively connected to said funnel (140) closing over said perforations (130) in a closed position when said float (110) is in said at least one higher specific gravity liquid (40) and opening said perforations (130) in an open position when said float (110) is in said lowest specific gravity liquid (50), and

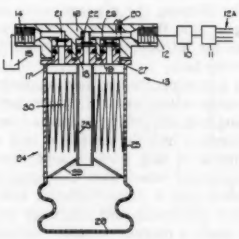
means (155) engaging said funnel (140) for delivering said lowest specific gravity liquid (50) from said underside (20) of said floating roof (30) when float (110) is in said open position.

4,512,884

FUEL TREATMENT DEVICE

William T. Wheatley, Walton-on-Thames, England, assignor to Lucas Industries, plc, Birmingham, England

Filed Jun. 14, 1982, Ser. No. 388,156
Claims priority, application United Kingdom, May 25, 1982, 8215237
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—136 **11 Claims**



1. A fuel treatment device for use in a fuel system of an internal combustion engine, comprising:

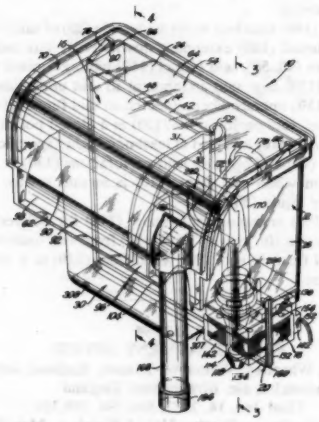
a casing means for containing a filter and for pumping fuel, said casing means comprising an outer wall means in direct contact with a fluid being filtered, said outer wall means including: a first section of generally cylindrical shape and having means thereon at one end thereof for attaching said casing means to a mounting, and a second pumping section means on another end of said first section for containing and pumping fluid, said second pumping section means closing said casing means and being collapsible to be moved axially of said casing means for reducing the volume within said casing means; a delivery tube attached to the mounting means to be located axially of said casing; a filter member located within said casing means first section and extending axially of said first section, and a dividing member attached to said delivery tube and spaced from said casing means first section to define a gap means for passing fluid from said filter member into said casing means second section, said delivery tube opening into said casing means second section for receiving fluid moved out of said second section when said second section is collapsed whereby fluid can be pumped by and from said casing means.

4,512,885

AQUARIUM FILTER ASSEMBLY

Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros., Inc., Englewood, N.J.

Filed Jan. 7, 1983, Ser. No. 456,424
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—136 **18 Claims**



1. An aquarium filter assembly, comprising:

a housing unit adapted to be mounted on a wall of an aquarium tank, and comprising an inlet chamber for receiving contaminated water from the aquarium tank, a filter chamber for filtering the contaminated water, said chambers being in fluid flow communication with each other, and means for introducing the filtered water back into the aquarium tank;

a motor unit supported by said housing unit, and

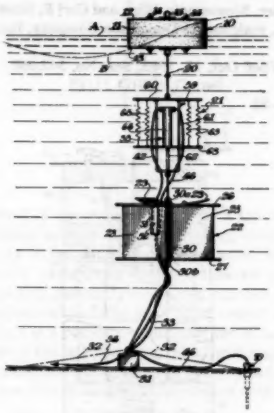
a removable unitary assembly supportably positioned by said housing and comprising an intake tube having an inlet end for insertion into the aquarium tank and a discharge end positioned in said inlet chamber thereby supplying the contaminated water from the aquarium tank to the inlet chamber, and a pump impeller unit depending from a position proximate said discharge end and comprising a fixed shaft, a magnet rotatably mounted on said shaft for positioning in magnetic flux relationship with said motor unit, and an impeller rotatable on said shaft and operably driven by said magnet thereby pumping the contaminated water through the filter assembly, and wherein said unitary assembly of said intake tube and pump impeller unit is removable as a single unit from said housing unit.

4,512,886

WAVE-POWERED DESALINATION OF WATER

Douglas C. Hicks, Newark, Del., and Charles M. Pleass, Havre de Grace, Md., assignors to University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 266,660, May 26, 1981, Pat. No. 4,421,461, which is a continuation-in-part of Ser. No. 76,217, Sep. 17, 1979, abandoned. This application Oct. 14, 1983, Ser. No. 542,248
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—170 **4 Claims**



1. A wave-powered desalination device comprising:

(a) a wave powered pumping device useful under trade wind conditions for producing water pressures of about 800 psi, said device comprising:

(i) a non-Archimedean wave follower connected in sequence with;

(ii) a piston pump having a cylinder within which is mounted a reciprocatory piston;

(iii) attachment means connecting one of the pair consisting of said cylinder and said reciprocatory piston with said wave follower and the other of said pair with mooring means, alone or in combination with a reaction unit;

said pump being in pressurized water communication with;

(b) a reverse osmosis desalination module, whereby to desalinate said water.

4,512,887

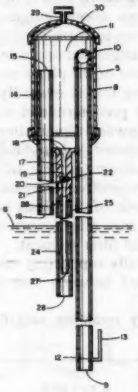
CHLORINE INJECTOR FOR TREATMENT OF EFFLUENT

Harold A. Ritke, and Randal G. Ritke, both of 1932 S. Kingsway Dr., Aurora, Ill. 60506

Filed Nov. 22, 1982, Ser. No. 443,761
Int. Cl.³ C02F *1/76*
U.S. Cl. 210—220 **7 Claims**

1. An injector of a water treating substance for treatment of water, comprising means defining a fluid passageway in communication with said water to be treated, first vacuum means to create a first vacuum in said passageway, second vacuum means to create a second vacuum in said passageway adjacent to and downstream from said first vacuum to add to and supplement the force of said first vacuum to provide a total vac-

uum force greater than either of said first and second vacuum means can provide acting separately, means defining a port opening to said passageway to introduce a water treating substance therein when said first and second vacuums are created, wherein said first vacuum means includes a venturi tubular member in said passageway, said venturi tubular member including a first nozzle, said first nozzle including an upstream end and a downstream end, a second nozzle positioned downstream of said first nozzle, said second nozzle including a flared end portion in registration with said downstream end of said first nozzle to create said first vacuum when fluid is flowed through said passageway, into and through said first and second nozzles of said venturi tubular member and the said flared end portion of said nozzles, wherein said second vacuum means includes an elongated tubular member in said passageway, said tubular member including an upstream end and a downstream end, means defining an inlet port opening to said upstream end of said elongated tubular member positioned above the surface of said water to be treated, means defining a discharge port opening to said downstream end of said elongated tubular member positioned below the surface of said water to be treated, said water to be treated providing back pressure at the said discharge port, and flow means to flow a fluid into said tubular member at a rate to fill such tubular



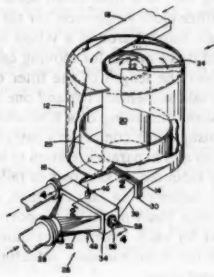
member until the pressure within said tubular member begins to exceed said back pressure resulting in more rapid discharge into said water to be treated and in creation of said second vacuum, said fluid filling said tubular member constituting a column of fluid extending from said inlet port to said discharge port of said tubular member, said column of fluid as it moves from said inlet port toward said discharge port causing a vacuum to form between said inlet port and said column of fluid as it moves toward said discharge port and said column of fluid as it moves toward said discharge port thereby creating said second vacuum, wherein said fluid passageway includes means defining a water chamber positioned above a body of effluent water to be treated, an effluent water inlet tube extending from said body of effluent water to said water chamber pressurized air means operatively associated with said effluent water inlet tube to flow effluent water upwardly into said water chamber, the bottom portion of said water chamber opening for flow of said effluent water outwardly of said chamber and past said first vacuum means to create said first vacuum, then past said second vacuum means to create said second vacuum, and means for introducing water treatment substance into the passageway wherein said water treating substance introduced into said passageway when said vacuums are created mixes with said effluent water flowing in said passageway for eventual discharge into said body of effluent water to treated.

4,512,888

APPARATUS FOR REMOVAL BY FLOTATION OF SOLID PARTICLES FROM LIQUID

Peter J. Flynn, North Attleboro, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Jul. 1, 1982, Ser. No. 394,290
Int. Cl.³ B03D 1/24
U.S. Cl. 210—221.2 **16 Claims**



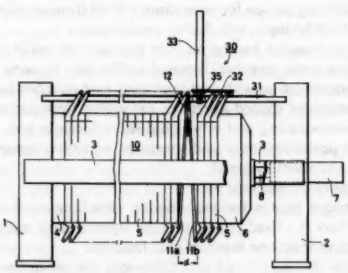
1. In apparatus for removal by flotation of solid particles contained in a liquid, which apparatus comprises a flotation cell having means defining an inlet for liquid to be treated, a first outlet for foam containing solid particles and a second outlet for cleaned liquid, and, upstream of said inlet, wall means defining a mixing chamber having a passage through which liquid passes before proceeding to said inlet and in which said liquid is charged with gas to form bubbles therein, the improvement wherein said wall means comprises a pair of opposed walls extending across said passage to form, with other said wall means, opposite faces of a flow path for liquid in said chamber of generally rectangular cross-section, said pair of walls converging to a restricted gap at their greatest convergence, said pair of walls diverging after said gap, and gas injection means for providing a flow of gas under superatmospheric pressure into the liquid as it flows through said restricted gap to form bubbles in the liquid distributed across the path of flow.

4,512,889

FILTER PRESS

Ichiro Noda; Yasuhiro Suekane, and Hisao Nakao, all of Sakaide, Japan, assignors to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,371
Claims priority, application Japan, Oct. 19, 1982, 57-184078
Int. Cl.³ B01D 25/12
U.S. Cl. 210—225 **1 Claim**



1. A filter press having a multiplicity of filter plates arranged side by side on a pair of guide rails extending in parallel and

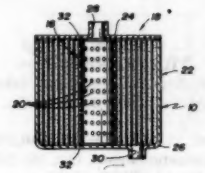
which can be separated one by one or twos, comprising a pair of filter cloths disposed between each two adjacent ones of the plates so as to cover the surfaces thereof and which are secured at the upper ends thereof to a filter-cloth suspension bar, one of said filter cloths being so disposed as to cover the surface of front-side one of said two plates and movably engaged and guided by a roller disposed below said rear-side plate, the lower end of said other filter cloth being secured to another filter-cloth securing bar, said filter-cloth securing bars being connected to said filter-cloth suspension bar through cord-like drive elements, each trained around a wheel disposed above the filter plates, and drive means for moving each of the filter cloths upwardly over the length of the filter cloth's portion extending between said suspension bar and one or the other of said rollers, said means consisting of a filter-cloth suspension-bar driving mechanism which comprises a pair of rails disposed above the filter plates and in parallel relation to said guide rails, a carriage movably mounted on said pair of rails, one or more hydraulic cylinders mounted on said carriage, a pair of arms having their respective bases pivotally supported at the front end of a piston rod for each hydraulic cylinder, and further hydraulic cylinders for simultaneously actuating free ends of said arms to open and close.

4,512,890

MEANS FOR THE SORPTION OF A PETROLEUM PRODUCT FROM A LIQUID

Seward J. Medbury, 28785 Oak Point, Farmington Hills, Mich. 48018

Filed Dec. 5, 1983, Ser. No. 557,863
Int. Cl.³ B01D *29/06*
U.S. Cl. 210—335 **6 Claims**



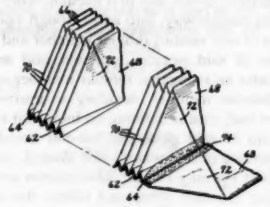
1. A filtering device for separating out oil from an oily liquid passed therethrough, said device comprising:
an outer housing having an inlet port and an outlet port;
a hollow inner member disposed within said housing and in communication with said inlet port, said member having a plurality of spaced apertures extending therethrough for communicating said oily liquid therethrough; and
a filter positioned over said apertures, said filter comprising:
a layer of sheet material;
a plurality of feathers; and
attachment means for individually attaching each of said feathers in a fixed position on the layer of sheet material to form at least one layer of said feathers;
wherein the feathers of said filter sorb the oil in the liquid and the sheet material passes the rest of the liquid therethrough upon relative movement between the liquid and the filter, said liquid thereafter passing out of the outlet port.

4,512,891

PLEATED FILTER ELEMENT WITH CONTROLLED EXPANSIBILITY AND FRAME THEREFOR

Mervin E. Wright, Apple Valley, and Donald D. Gronholz, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 16, 1982, Ser. No. 442,234
Int. Cl.³ B01D *27/06, 46/52*
U.S. Cl. 210—445 **18 Claims**



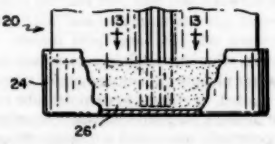
1. A filter assembly, comprising:
a pleated filter element having opposite sides;
said filter element including a sheet of filter media folded in alternate directions about longitudinally spaced-apart transverse fold lines to form accordion pleats extending between opposite edges and opposite ends of the sheet, the ends of at least some of the pleats on the same side of said filter element being folded inwardly about diagonal fold lines extending at predetermined angles between points spaced laterally inward along alternate transverse fold lines and points spaced longitudinally inward along the edges of the sheet from the next adjacent transverse fold lines toward the respective alternate transverse fold lines with the folded ends of the pleats being tucked between adjacent pleats so as to effect controlled pleat spacing and expansibility of said filter element;
a frame for peripherally supporting said filter element;
seal means positioned between said frame and filter elements; and
means for releasably retaining said filter element in said frame.

4,512,892

METHOD AND STRUCTURE FOR SEALING TUBULAR FILTER ELMENTS

Gary C. Ganzi, Lexington, and Charles T. Paul, Westford, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Feb. 14, 1980, Ser. No. 121,561
Int. Cl.³ B01D *27/06*
U.S. Cl. 210—493.2 **17 Claims**



1. In a tubular filter element comprising a pleated microporous membrane disposed for fluid flow therethrough from its upstream side to its downstream side and having its ends sealed in solidified liquid sealer, said membrane comprising a sheet material having pores between about 0.1 and 25 microns in size and about 50–80% voids by volume, the improvement wherein each end of the membrane on its upstream side includes a barrier strip of non-porous pleated film, one portion of the strip being joined fluid-tight to the membrane and the other portion

being free from the membrane to permit relative movement therebetween, the solidified sealer terminating on the other portion of the film and sealing fluid-tight to the film and downstream side of the membrane, whereby the membrane may flex away from the other portion of the strip in response to upstream pressure.

4,512,893

POROUS AROMATIC IMIDE POLYMER MEMBRANE AND A PROCESS FOR ITS MANUFACTURE

Hiroshi Makino; Yoshihiro Kusuki; Takashi Harada; Hiroshi Shimazaki, and Tosio Isida, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Chiba, Japan

Filed Apr. 13, 1982, Ser. No. 367,954

Claims priority, application Japan, Apr. 14, 1981, 56-54966; Apr. 14, 1981, 56-54965

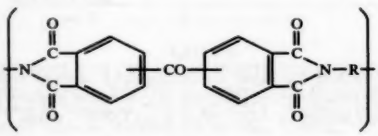
Int. Cl.³ B29D *27/04*; B32B *9/02*

U.S. Cl. 210—500.2 **14 Claims**

1. A process for producing a porous aromatic imide polymer membrane, comprising the steps of:

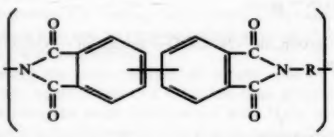
(1) dissolving 3 to 30% by weight of an aromatic imide copolymer which has a degree of imidization of at least 90% and comprises at least 80 molar % of at least one type of recurring unit selected from the group consisting of those of the formulae (I) and (II):

(I)



and

(II)



wherein R represents a member selected from divalent aromatic radicals, in 70 to 97% by weight of a solvent consisting essentially of a homogeneous mixture of:

(A) 100 parts by weight of a base solvent consisting essentially of at least one polar organic compound, which base solvent is capable of dissolving therein said aromatic imide polymer in a concentration of 5% by weight of more therein and of evaporating at a temperature of from 50° to 400° C., and

(B) 5 to 150 parts by weight of an additional liquid consisting essentially of at least one polar organic compound, which additional liquid is incapable of dissolving therein 3% by weight or more of said aromatic imide polymer and is capable of evaporating at a smaller evaporating rate than that of said base solvent at the above-mentioned evaporating temperature so as to provide a dope solution;

(2) forming a thin layer of said dope solution; and

(3) gradually and completely removing said solvent from said thin layer of said dope solution by means of a dry-evaporating method at a temperature of from 50° C. to 400° C., to form a porous aromatic imide polymer membrane.

14. A porous aromatic imide polymer membrane prepared by the process as claimed in claim 1.

4,512,894

PROCESS FOR THE PRODUCTION OF SEMIPERMEABLE POLYBENZIMIDAZOLE MEMBRANES AND THE RESULTANT PRODUCT

Donald G. J. Wang, Tamshui, Taiwan, assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,719

Int. Cl.³ B29D *27/00*

U.S. Cl. 210—500.2 **55 Claims**

1. In a process for the production of a semipermeable polybenzimidazole membrane wherein a film or hollow filament is formed from a solution of a polybenzimidazole polymer and subsequently subjected to an annealing step at elevated temperatures in the presence of an annealing medium, the improvement comprising conducting said annealing step in the presence of a non-aqueous annealing medium at a temperature below about 125° C. comprised of a solvent for said polymer and a non-solvent for said polymer whereby said membrane exhibits enhanced separative properties in contrast to a membrane having been annealed in an annealing medium which does not comprise a solvent for said polymer.

15. A semipermeable membrane produced in accordance with the process of claim 1.

4,512,895

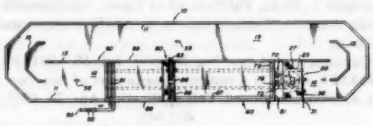
PUMPLESS CLARIFIER APPARATUS AND PROCESS FOR OPERATION THEREOF IN COMBINATION WITH A DRAFT TUBE CIRCULATOR/AERATOR

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

Continuation-in-part of Ser. No. 361,205, Mar. 29, 1982, Pat. No. 4,455,232, which is a continuation-in-part of Ser. No. 75,412, Sep. 14, 1979, Pat. No. 4,394,268, which is a continuation-in-part of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,547, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Oct. 12, 1982, Ser. No. 433,639

Int. Cl.³ C02F *3/20*

U.S. Cl. 210—627 **26 Claims**



18. A process for continuously clarifying a portion of mixed liquor being aerobically treated in a barrier oxidation ditch by gravity settling said portion in a clarifier to produce clarified liquor and settled sludge without utilizing a pump for mixed liquor feed to said clarifier, clarified liquor outflow from said clarifier, or sludge return from said clarifier to said ditch, said barrier oxidation ditch comprising an endless channel containing said mixed liquor which is moving in circuit flow therethrough, a barrier sealably disposed athwart said endless channel to form an intake channel and a discharge channel, and a circulator/aerator for aerating and pumping said mixed liquor from said intake channel to said discharge channel at high velocity, said process comprising:

A. locating at least one intake line for mixed liquor feed to said clarifier where said high velocity is available;

B. disposing said intake line so that said high-velocity liquor is intercepted and the pump head of said high-velocity liquor is selectively received; and

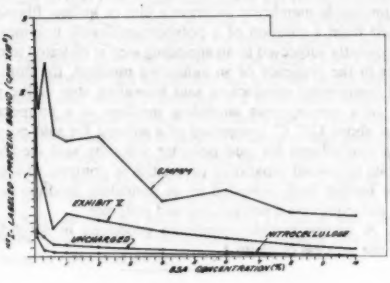
C. transferring said mixed liquor feed to said clarifier while conserving said pump head so that the surface of clarified liquor within said clarifier is higher than the surface of said mixed liquor within said endless channel, the contents of said clarifier being sealably isolated from the contents of said endless channel.

4,512,896

TRANSFER OF MACROMOLECULES FROM A CHROMATOGRAPHIC SUBSTRATE TO AN IMMOBILIZING MATRIX

Jonathan M. Gershoni, Hamden, Conn., assignor to Yale University, New Haven, Conn.

Filed Feb. 7, 1983, Ser. No. 464,609
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—635 **54 Claims**



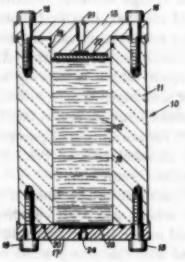
19. In a method for the transfer of macromolecule from a chromatographic substrate to an immobilizing matrix, the improvement which comprises employing as said matrix, a hydrophilic charge modified microporous membrane comprising an organic microporous membrane having a charge modifying amount of a cationic charge modifying agent bonded to substantially all of the surfaces of said membrane wetted by a fluid passing through said membrane or in which said membrane is immersed.

4,512,897

MOLECULAR SEPARATION COLUMN AND USE THEREOF

Alvin L. Crowder, III, Cromwell; Nils L. Dailey, Wallingford; Joseph V. Fiore, Fairfield all of Conn., and Kenneth C. Hou, San Antonio, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 287,609, Jul. 28, 1981, Pat. No. 4,384,957, which is a continuation-in-part of Ser. No. 184,822, Sep. 8, 1980, abandoned. This application Apr. 20, 1983, Ser. No. 474,947
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—656 **30 Claims**



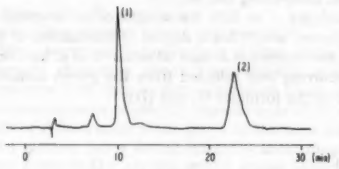
16. In a method of effecting a chromatographic separation by effecting a differential distribution of a sample's components between two phases by passing a mobile phase through a chromatography column containing a solid stationary phase, the improvement which comprises employing as said stationary phase a porous matrix of fiber having particulate immobilized therein, at least one of said fiber or particulate having chromatographic functionality and being effective for chromatographic separation, said solid stationary phase being substantially homogeneous with respect to each component thereof, wherein said solid stationary phase cooperates with the interior wall of the column to form a substantially fluid tight seal therewith, preventing any appreciable skewing or bypass of fluid around the solid stationary phase.

4,512,898

PACKING MATERIALS FOR CHROMATOGRAPHIC USE AND A METHOD FOR ANALYSIS OF AN ENANTIOMER MIXTURE USING THE SAME

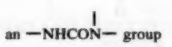
Naobumi Oi, Kyoto, and Hajimu Kitahara, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Sep. 30, 1983, Ser. No. 538,011
Claims priority, application Japan, Sep. 30, 1982, 57-173003; Oct. 1, 1982, 57-173688
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—656 **12 Claims**



7. A method for liquid chromatography analysis which comprises separating and analyzing an enantiomer mixture of a compound having an —OH group, a —CONH— group,

a —COO— group, an —NHCOO— group, an —NHCONH— group or an



bonded to an asymmetric carbon atom thereof by using a packing material for chromatographic use obtained by grafting on an inorganic carrier having hydroxyl groups at the surface thereof an organosilane derivative selected from the group consisting of an N-carbamoyl amino acid derivative obtained by reacting an optically active amino acid carbamoylated by isocyanate with an aminoalkylsilane and an O-carbamoyl hydroxy acid derivative obtained by reacting an optically active hydroxy acid carbamoylated by isocyanate with an aminoalkylsilane.

4,512,899

LIQUID CHROMATOGRAPHY TUBE CONNECTIONS

Lyman E. Goodnight, Jr., North Palm Beach, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Mar. 19, 1984, Ser. No. 590,893
Int. Cl.³ B01N *15/08*
U.S. Cl. 210—656 **5 Claims**

1. Liquid chromatography apparatus comprising:

a rigid tube to convey fluid under pressure within said apparatus having first and second ends, said first end being connected to a section of said apparatus containing fluid under pressure,

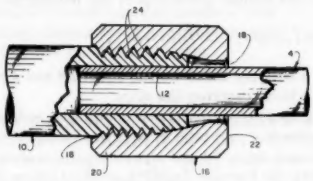
a pliable tube to convey fluid to or from said rigid tube having first and second ends, the I.D. of said pliable tube being substantially equal to the O.D. of said rigid tube,

said second end of said rigid tube being inserted a predetermined distance into said first end of said pliable tube,

a tubular member having:

a length about equal to said predetermined distance,

a threaded, tapered bore that extends longitudinally and centrally through said member, the largest I.D. of said



bore being greater than the O.D. of said pliable tube and the smallest I.D. of said bore being less than said O.D. of said pliable tube but greater than said O.D. of said rigid tube,

said tubular member surrounding said pliable tube at the position of insertion therein of said second end of said rigid tube with the threads of said bore deforming said pliable tube and compressing it against said second end of said rigid tube.

4,512,900

METHOD FOR TREATING WASTE COMPOSITIONS

George J. Macur, Endwell; W. Robert Pratt, Binghamton, and James E. Sharkness, Ithaca, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1983, Ser. No. 561,030

Int. Cl.³ C02F *1/32*

U.S. Cl. 210—748 **26 Claims**

1. A process for treating liquid waste composition containing copper ions and an organic complexing agent for the copper ions which comprises:

reducing the concentration of copper ions in said liquid waste composition to a value less than about 8 ppm;

contacting the waste composition with H_2O_2 in an amount and in a concentration effective to destroy from about 20 to about 60% by weight of total organic content; and

then contacting the resulting partially-treated waste composition with an ozone-containing gas in an amount effective to react with and destroy complexing agent and organic materials and irradiating the ozone-containing waste composition with ultraviolet light.

4,512,901

SOLVENT ADDITION TO DEEP BED FILTER

Robert S. Kozar, Livonia, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 11, 1980, Ser. No. 176,658

Int. Cl.³ B01D *23/10*

U.S. Cl. 210—792 **2 Claims**

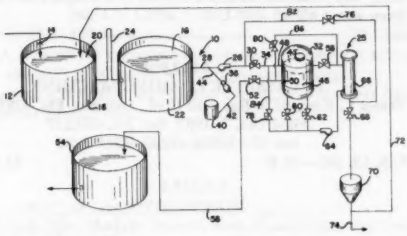
1. A method of filtering droplets of heavy, viscous oil mixed with an aqueous liquid, said method comprising the steps of:

flowing a batch of said aqueous liquid-oil mixture into a filter device,

adding a selective quantity of a solvate to said mixture upstream from said filter device, said quantity of said solvate being proximately equal to a quantity of said oil in said mixture and said solvate comprising a solvent portion and an emulsifying portion,

dispersing said solvent portion with said emulsifying portion of said solvate within said aqueous liquid-oil mixture to cause said solvent portion to interact with said oil droplets,

entrapping said interacted oil droplets in a bed of granular filter media held within said filter device to allow said aqueous liquid to flow from said filter device in a clean, substantially oil-free state, and



rejuvenating said filter media periodically by flushing said interacted oil droplets from said bed upon said entrapped oil droplets inhibiting an efficient flow of said aqueous liquid through said filter media.

4,512,902

PROCESS FOR AUGMENTING OR ENHANCING AROMA OF CONSUMABLE MATERIAL BY ADDING THERETO 1,2,3,3,5,6-HEXAMETHYL-BICYCLO[2.2.2]-OCT-5-EN-2-OL

William J. Evers, Locust; Braja D. Mookherjee, Holmdel; Anton Van Ouwerkerk, Livingston, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 371,930, Apr. 26, 1982, Pat. No. 4,434,085.

This application Sep. 26, 1983, Ser. No. 536,161

Int. Cl.³ C11D *3/50;* **D06M** *13/20*

U.S. Cl. 252—8.6 **4 Claims**

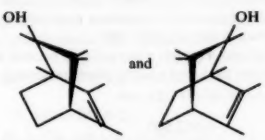
1. A process for augmenting or enhancing the aroma of any one of the following consumable materials:

(i) solid or liquid anionic, cationic, nonionic or zwitterionic detergents;

(ii) fabric softener compositions;

(iii) fabric softener articles; and

(iv) perfumed polymers comprising the step of intimately admixing with said consumable material, an aroma augmenting or enhancing quantity of at least one compound having a structure selected from the group consisting of:



4,512,903

LUBRICANT COMPOSITIONS CONTAINING AMIDES OF HYDROXY-SUBSTITUTED ALIPHATIC ACIDS AND FATTY AMINES

Raymond C. Schlicht, Fishkill, and Anthony P. Skrobul, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,270

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A **6 Claims**

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity and a minor effective friction-reduc-

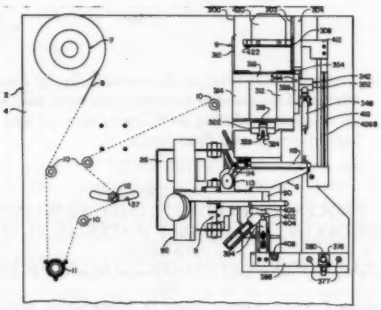
ing amount of a reaction product formed by reacting equimolar amounts of an amine represented by the forming RR'NH wherein R is an aliphatic-based hydrocarbyl radical of about 10 to about 30 carbon atoms and R' is hydrogen or an alkyl group having 12 to 18 carbon atoms, with a hydroxy-substituted aliphatic monocarboxylic acid selected from the group consisting of glycolic, lactic, and 2,2 bis-(hydroxymethyl)propionic acid, said reaction being conducted at a temperature ranging from about 60° to 180° C.

4,512,904

IN-CASSETTE LOADING MACHINE

James L. King, 8520 Bay Hill Blvd., Orlando, Fla. 32811

Filed Oct. 7, 1982, Ser. No. 433,237
Int. Cl.³ B65H *19/20*; B31F *5/06*
U.S. Cl. 242—56 R **41 Claims**



1. In a machine for loading tape into cassettes, a splicer head assembly comprising:

a splicing block support plate;

a first splicing block having a first guideway for receiving a first leader or use tape, said first block being affixed to said support plate for movement therewith;

a second splicing block having a second guideway for receiving a use tape and a third guideway for receiving a leader tape, said second and third guideways being parallel to said first guideway;

means rotatably mounting said second block to said support plate for rotation on a first axis extending parallel to said second and third guideways;

means rotatably mounting said support plate for pivotal movement about a second axis extending parallel to said first axis;

means for rotating said second block on said first axis between a first position in which said first and second guideways are aligned and a second position in which said first and third guideways are aligned; and

means for pivoting said support plate on said second axis on command between first and second limit positions.

4,512,905

METHOD OF MAKING SODIUM ZIRCONIUM SILICO-PHOSPHATES

Abraham Clearfield, College Station, Tex., and Paul Jerus, Louisville, Ky., assignors to The Texas A&M University System, College Station, Tex.

Continuation-in-part of Ser. No. 379,567, May 18, 1982, abandoned. This application Dec. 23, 1982, Ser. No. 432,795
Int. Cl.³ H01G *9/02*
U.S. Cl. 252—62.2 **9 Claims**

1. A method of preparing a crystalline compound which provides fast sodium ion transport which comprises heating a hydrated orthorhombic crystalline solid having the formula on a water-free basis

$$Na_{1+x+4y}Zr_{2-y}(SiO_4)_x(PO_4)_{3-x}$$

where x is between about 1.0 and about 2.8 and y is between 0 and 0.5, at a temperature between about 1,000° C. and about 1,250° C. until the orthorhombic crystalline solid is converted to a homogeneous, fast sodium ion conducting, monoclinic or rhombohedral crystalline sodium zirconium silico-phosphate of the formula indicated above, or a mixture of the two free from any separate, detectable zirconia phase.

4. A method of preparing a crystalline compound which provides fast sodium ion transport and having the formula:

$$Na_{1+x+4y}Zr_{2-y}(SiO_4)_x(PO_4)_{3-x}$$

where x is between about 1.0 and about 2.8 and y is between 0 and 0.5, which comprises the steps:

heating an aqueous dispersion comprising soda and silica in solution in a mol ratio of soda to silica of between about 0.9:1 and about 4:1 and a powdered zirconium phosphate having the formula $Zr(MPO_4)_2.zH_2O$ where M is hydrogen, sodium or a mixture of hydrogen and sodium, and z is an integer from 0 to 10, in an amount to provide a mol ratio of silica to zirconium phosphate of between about 1.2:1 and about 1.8:1, the proportions of the soda, silica and phosphate in the reaction mixture being in excess of the proportions of these materials in the final product, said heating being conducted at a temperature between about 250° C. and about 350° C., until reaction occurs and a precipitate is formed,

separating precipitated material from supernatant liquid, and washing and drying such separated precipitate to recover a hydrated orthorhombic crystalline solid, and

calcining the hydrated orthorhombic crystalline solid at a temperature between about 1000° C. and about 1250° C. until conversion to a homogeneous, fast sodium ion conducting, monoclinic or rhombohedral crystalline, sodium zirconium silico-phosphate of the formula indicated above, or a mixture of the two, free from any separate, detectable zirconia phase, is substantially complete.

4,512,906

WET PROCESS FOR PREPARING FERRITES OF MAGNETOPLUMBITE STRUCTURE IN FINE PARTICLE FORM

Masanori Hayakawa, and Satoshi Nishimura, both of Ube, Japan, assignors to Central Glass Company Limited, Ube, Japan

Continuation of Ser. No. 434,512, Oct. 15, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 647,879
Claims priority, application Japan, Oct. 16, 1981, 56-164091
Int. Cl.³ C04B *35/26*
U.S. Cl. 252—62.63 **7 Claims**

1. A process for preparing fine particles of a ferrite having the magnetoplumbite structure, the process comprising:

subjecting to hydrothermal treatment in an aqueous alkali solution γ-Fe_2O_3 and at least one compound of a divalent metal selected from the group consisting of Ba, Sr and Pb, wherein said at least one compound of divalent metal is a salt selected from the group consisting of chlorides, nitrates and hydroxides, wherein the proportion of said γ-Fe_2O_3 to said at least one compound of divalent metal is such that the mole ratio of Fe_2O_3 to the total of BaO, SrO and PbO given by said at least one compound in the hydrothermal treatment, is in the range of from 4:1 to 6:1, and wherein said hydrothermal treatment is performed at temperatures in the range of from about 180° C. to about 260° C.

4,512,907

ICE MELTER AND METHOD OF MAKING SAME

Forrest M. McConnell, Lake Forest, Ill., assignor to Koos, Inc., Kenosha, Wis.

Filed Feb. 6, 1984, Ser. No. 577,257
Int. Cl.[3] C09K 3/18
U.S. Cl. 252—70 3 Claims

1. An ice melter composition for use on driveways, sidewalks and the like comprising:

a salt combination and an amide,

said salt combination comprising a mixture of sodium and potassium chloride and said amide is urea,

said sodium choride being present in the ratio by weight of 3 to 1 of said potassium chloride.

4,512,908

HIGHLY ALKALINE LIQUID WAREWASHING EMULSION STABILIZED BY CLAY THICKENER

Bernard J. Heile, Apple Valley, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jul. 5, 1983, Ser. No. 510,947
Int. Cl.[3] C11D 7/56
U.S. Cl. 252—160 8 Claims

1. A highly alkaline composition having cleaning and stain removing properties which consists essentially of:

(a) water;

(b) 15–45% of a sodium condensed phosphate hardness sequestering agent;

(c) about 5 to 25% of sodium hydroxide or potassium hydroxide;

(d) about 2 to 35% of an inorganic source of chlorine; and,

(e) about 0.2 to 5% of a hectorite clay dispersant-thickening agent incorporating silicon dioxide, magnesium oxide, sodium oxide, lithium oxide and structural water of hydration in a ratio of about 25–75:20–40:1–10:0.1–1:1–10 wherein said agent is present in an amount effective to maintain the composition as a stable liquid emulsion or dispersion which is substantially resistant to deterioration under alkaline conditions.

4,512,909

USE OF A HYDROQUINONE COMPOUND WITH HYDRAZINE (1:1 MOLAR RATIO) AS AN OXYGEN-SCAVENGING AND A CORROSION-INHIBITING AGENT

Henry W. Schiessl, Northford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jun. 30, 1982, Ser. No. 393,831
Int. Cl.[3] C09K 15/08, 15/20; C01B 21/16; C02F 1/20
U.S. Cl. 252—188.28 7 Claims

1. An oxygen-scavenging and corrosion-inhibiting composition for protecting metal surfaces against corrosion from oxygen-containing fluidic systems in contact therewith comprising a hydroquinone compound with hydrazine (1:1 molar ratio) which is formed by reacting hydroquinone and hydrazine in a mole ratio of at least about 0.75:1 about 0.75:1, said compound being spectroscopically characterized by a stretching vibration for a $-NH_3^+$ group at 2500 wave numbers and a bending vibration at 1480 wave numbers.

4. A method for scavenging oxygen and for protecting metal surfaces against corrosion caused by contact of an oxygen-containing fluid therewith comprising

adding an effective amount of a hydroquinone compound with hydrazine (1:1 molar ratio) to the fluidic system to scavenge at least a portion of the oxygen contained therein and to inhibit corrosion on the metal surfaces in contact therewith, said compound being formed by reacting hydroquinone and hydrazine in a mole ratio of at least about 0.75:1, and said compound being spectroscopically characterized by a stretching vibration for a $-NH_3^+$ group at 2500 wave numbers and a bending vibration at 1480 wave numbers.

4,512,910

PHOTOCURABLE COMPOSITIONS

Claude J. Schmidle, Trenton, N.J., assignor to Morton Thickol, Inc., Chicago, Ill.

Continuation of Ser. No. 343,659, Jan. 28, 1982, Pat. No. 4,377,679. This application Nov. 5, 1982, Ser. No. 439,449
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.[3] C09K 3/00; C08G 18/00
U.S. Cl. 252—188.31 10 Claims

1. A process for preparing compositions having a viscosity from about 20 to 30 poise, said process comprising:

reacting a polyether diol and an acrylic acid in about equal molar proportions.

4,512,911

PHOSPHOR

Noboru Kotera; Shusaku Eguchi, both of Odawara, and Norio Miura, Isehara, all of Japan, assignors to Kasei Optonix, Ltd., Japan

Continuation of Ser. No. 442,765, Nov. 10, 1982, abandoned, which is a continuation of Ser. No. 159,848, Jun. 16, 1980, abandoned. This application Sep. 20, 1983, Ser. No. 533,949
Claims priority, application Japan, Jun. 19, 1979, 54-77290; Jun. 19, 1979, 54-77291
Int. Cl.[3] C09K 11/467
U.S. Cl. 252—301.4 H 5 Claims

1. A rare earth element activated complex halide phosphor represented by the formula

$$BaF_2.aBaX_2.bMgF_2.cBeF_2.dMe^{II}F_2:eLn$$

wherein X is at least one halogen selected from the group consisting of chlorine, bromine and iodine; Me^{II} is at least one divalent metal selected from the group consisting of calcium and strontium, Ln is at least one rare earth element selected from the group consisting of divalent europium (Eu^{2+}), cerium (Ce^{3+}) and terbium (Tb^{3+}), and a, b, c, d and e are numbers satisfying the conditions of $0.90 \leqq a \leqq 1.05$, $0 \leqq b \leqq 1.2$, $0 < c \leqq 1.2$, $10^{-6} \leqq e \leqq 0.03$ and $0 < c+d \leqq 1.2$, respectively and BeF_2 is present in an amount sufficient to effect a phosphor exhibiting a higher luminance than said phosphor absent BeF_2 when stimulated by light of a wavelength ranging from 450 to 800 nm after exposure to X-rays.

4,512,912

WHITE LUMINESCENT PHOSPHOR FOR USE IN CATHODE RAY TUBE

Naotoshi Matsuda, Kawasaki; Yoshinori Tetsuishi, and Kazuaki Higuchi, both of Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 6, 1984, Ser. No. 637,724
Claims priority, application Japan, Aug. 11, 1983, 58/145729
Int. Cl.[3] C09K 11/477
U.S. Cl. 252—301.6 S 13 Claims

1. A white emitting luminescent phosphor for use in a cathode ray tube, which consists essentially of a mixture of from about 10 to 40 wt.% of a blue luminescent phosphor having the composition of ZnS:Ag, and having a 10% afterglow period of at least 10 microseconds, and at least one phosphor having a composition of the following formula:

$$In_{1-p-q-r}M_pEu_qTb_rBO_3$$

wherein M represents at least one element selected from the group consisting of Sc, Lu, Y, La, Gd and Ga; and each of p, q, and r represents a number satisfying the relationships of $p \geqq 0$, $q \geqq 0$, $r \geqq 0$ and $0 < p+q+r < 1$, and having a 10% afterglow period of 10 milliseconds or longer.

4,512,913

SOL-GEL SOLUTION PREPARATION

George W. Ritter, II, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 12, 1982, Ser. No. 397,667
Int. Cl.[3] B01J *13/00*; C09K *3/00*
U.S. Cl. 252—313.1 10 Claims

1. A method of producing a hydrosol which comprises reacting a Group II water soluble metal salt with an aluminum chlorohydrate-alkylene glycol complex to produce a hydrosol and incorporating into said hydrosol a viscosity control agent selected from the group consisting of water soluble ether alcohols, ethers, and monoprotic acid salts of triethanol amine.

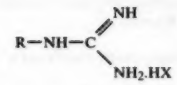
4,512,914

COMPOSITIONS AND METHOD FOR TREATING OIL SLICKS

Andre Lepain, Rosieres, and Robert D. E. M. Bronchart, Brussels, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Feb. 3, 1983, Ser. No. 463,491
Int. Cl.[3] B01F *17/02*
U.S. Cl. 252—355 10 Claims

1. Dispersing compositions for treating oil slicks on seawater, comprising at least one surface-active agent, at least one solvent, and a monoalkylguanidinium salt having the general formula



wherein R is an aliphatic hydrocarbon radical containing from about 8 to about 20 carbon atoms, and X is a halogen or an acid anion.

4,512,915

COMPOSITION AND METHOD OF INHIBITING CORROSION BY WATER OF METAL SUBSTRATES

Jean-Claude Lumaret, Bethune; Serge Gosset, Lestrem, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France

Filed Aug. 24, 1982, Ser. No. 410,987
Claims priority, application France, Aug. 31, 1981, 81 16601
Int. Cl.[3] C23F *11/18*
U.S. Cl. 252—389 A 19 Claims

1. Composition for inhibiting corrosion by water of metal substrates comprising:

zinc gluconate or glucoheptonate and

at least one water-soluble inorganic polyphosphate selected from the group consisting of alkali metal hexametaphosphate and tripolyphosphate,

wherein the ratio by weight of zinc gluconate or glucoheptonate/polyphosphate is from 1/5 to 5/1.

4,512,916

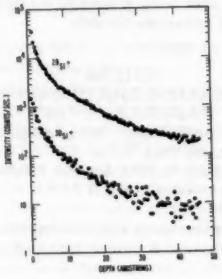
VIDEO DISC MOLDING COMPOSITION

Pabitra Datta, Cranbury, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 27, 1982, Ser. No. 452,915
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—511 22 Claims

1. A conductive molding composition comprising a polyvinylchloride-based resin, a sufficient amount of finely divided conductive carbon black particles such that the composition has a bulk resistivity below about 500 ohm-cm at 900 mHz, from about 0.5 to about 3 percent by weight of a lubricant, from about 1 to about 5 percent by weight of a plasticizer, from about 1 to about 5 percent by weight of a stabilizer, and from about 0.1 to about 1 percent by weight of an organo-silicone compound having polar groups.

11. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of molded plastic material containing a sufficient amount of finely divided conductive particles such that the material has a bulk resistivity below about 500 ohm-cm at 900 mHz and having an information track



in a surface thereof constituted by a surface relief pattern of such dimension to accommodate recovery of said signals upon establishment of said motion at said rate, the improvement comprising employing as said plastic material a conductive molding composition comprising a polyvinylchloride-based resin, finely divided conductive carbon black particles, from about 0.5 to about 3 percent by weight of a lubricant, from about 1 to about 5 percent by weight of a plasticizer, from about 1 to about 5 percent by weight of a stabilizer, and from about 0.1 to about 1 percent by weight of an organo-silicone compound having polar groups.

4,512,917

HEXABORIDE RESISTOR COMPOSITION

Paul C. Donohue, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 525,507, Aug. 22, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 581,601
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—521 8 Claims

1. A composition for the preparation of thick film resistors comprising an admixture of finely divided particles of:

A. 2–70% by weight, basis total solids, of conductive metal hexaboride selected from the group consisting of LaB_6, YB_6, rare earth hexaboride, CaB_6, SrB_6 and mixtures thereof; and

B. 98–30% by weight, basis total solids, of an alkali metal or alkaline earth metal aluminosilicate crystallizable glass comprising 70–95 mole % components which are irreducible by the conductive metal hexaboride having dissolved therein 30–5 mole % Ta_2O_5.

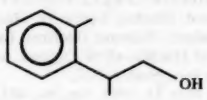
4,512,918

PERFUMERY USES OF PHENYL ALKANOLS

Wilhelmus J. Wiegers, Red Bank, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 7, 1983, Ser. No. 482,823
Int. Cl.[3] A61K *7/46*; C11B *9/00*
U.S. Cl. 252—522 R 4 Claims

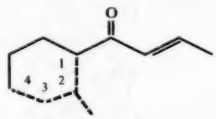
1. A composition of matter comprising a compound having the structure:



and intimately admixed therewith a compound selected from the group consisting of:

(a) 3-methyl-1-phenyl-pentanol-5; and

(b) at least one butanoyl cyclohexane derivative defined according to the structure:



wherein one or two of the dashed lines represent carbon-carbon double bonds and the other of the dashed lines represent carbon-carbon single bonds with the proviso that when the dashed lines represent two carbon-carbon double bonds, said carbon-carbon double bonds are conjugated.

2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of a composition of matter defined according to claim 1.

4,512,919

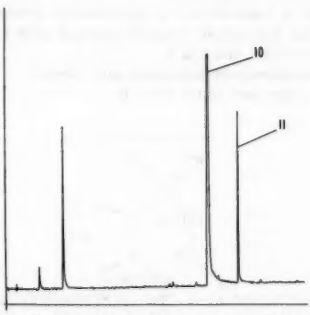
2-METHOXY-4-(2-METHYLPROPENYL) PHENYL ESTER OF ISOBUTYRIC ACID, AND USE IN AUGMENTING OR ENHANCING AROMA OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES

Richard A. Wilson, Westfield; Michael J. Zampino, North Bergen; David R. Bowen, Red Bank, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 505,411, Jun. 16, 1983, Pat. No. 4,473,588. This application Sep. 26, 1983, Ser. No. 535,690

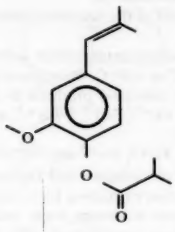
Int. Cl.³ A61K *7/46;* **C11D** *17/00*

U.S. Cl. 252—522 R **6 Claims**



GLC PROFILE FOR EXAMPLE I, BULKED FRACTIONS (3-8)

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of the compound having the structure:



4,512,920

SILANES USEFUL AS ANTI-TREEING ADDITIVES

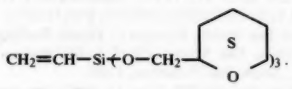
Harry Braus; Anthony Barlow, and Melvin F. Maringer, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,978

Int. Cl.³ H01B *3/18*

U.S. Cl. 252—573 **5 Claims**

1. A compound having the structure:



4,512,921

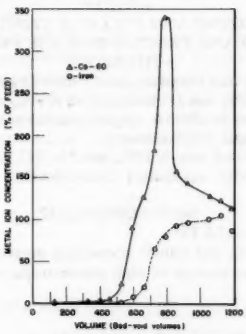
NUCLEAR REACTOR COOLING SYSTEM DECONTAMINATION REAGENT REGENERATION

Larry D. Anstine, San Jose; Dean B. James, Saratoga; Edward A. Melaika, Berkeley, and John P. Peterson, Jr., Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 156,945, Jun. 6, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 420,464

Int. Cl.³ G21F *9/28;* **G21C** *19/30*

U.S. Cl. 252—626 **8 Claims**



PRE-EQUILIBRATED ANION EXCHANGE RESINS.

1. A method of removing corrosion products from the coolant system of a water-cooled nuclear reactor comprising the steps of:

(a) adding at least one soluble weak-acid organic complexing

agent selected from the group consisting of oxalic acid, citric acid, nitrilotriacetic acid and hydroxyethylethylenediaminetriacetic acid to the coolant to form a decontamination solution;

(b) adjusting the pH of the decontamination solution to from 2.5 to 4.0;

(c) circulating and decontamination solution at a temperature of from 60° to 100° C. throughout the coolant system to dissolve the corrosion products to form a complexed ion solution of Fe^{+2}, Fe^{+3}, $^{60}Co^{+2}$, and other metal ion complexes; and

(d) removing the Fe^{+2}, Fe^{+3} and $^{60}Co^{+2}$ complexes from the complexed ion solution and regenerating the decontamination solution by passing the complexed ion solution through an anion exchange resin, said anion exchange resin having been presaturated with the anions of the weak-acid organic complexing agent of the decontamination solution such that the concentration of the agents on the resin is substantially the same concentration of the agents in the decontamination solution and having the same pH of the decontamination solution.

4,512,922

PURIFICATION AND ACTIVITY ASSURANCE OF PRECIPITATED HETEROLOGOUS PROTEINS

Andrew J. S. Jones, San Mateo; Kenneth C. Olson, Burlingame, and Steven J. Shire, San Mateo, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 452,253, Dec. 22, 1982, abandoned.
This application Jun. 1, 1984, Ser. No. 615,679
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R **9 Claims**

1. A process for solubilizing and maintaining the solubility of protein precipitated in the form of refractile bodies in a host cell culture, comprising solubilizing said refractile bodies in a strongly denaturing solution, and replacing the strongly denaturing solution with a different weakly denaturing medium while keeping the protein solubilized.

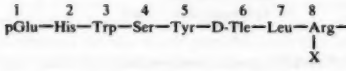
4,512,923

LUTEINIZING AND FOLLICLE STIMULATING HORMONES AND PROCESS FOR THE PREPARATION THEREOF

Martin Flegel; Jan Pospisek; Josef Picha; Drahomira Pichova; Milan Krojidlo, and Jiri Kolinsky, all of Prague, Czechoslovakia, assignors to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia

Filed Aug. 8, 1983, Ser. No. 521,108
Claims priority, application Czechoslovakia, Aug. 6, 1982, 5868-82
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 LH **2 Claims**

1. Luteinizing and follicle stimulating hormone, capable of releasing factor analogs of high gonadotropic activity, of the formula



wherein X is selected from the group consisting of a hydrogen atom and a protective group.

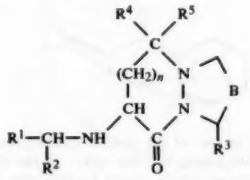
4,512,924

PYRIDAZO[1,2-a][1,2]DIAZEPINES

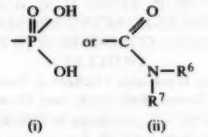
Michael R. Attwood, Hitchin; Cedric H. Hassall, Harpenden; Robert W. Lambert, Welwyn; Geoffrey Lawton, and Sally Redshaw, both of Hitchin, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 12, 1983, Ser. No. 493,876
Claims priority, application United Kingdom, May 12, 1982, 8213850; Feb. 28, 1983, 8305505
Int. Cl.³ C07D *487/04*
U.S. Cl. 260—243.3 **28 Claims**

1. Compounds of the formula



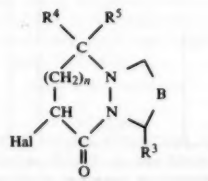
wherein B represents an ethylene group, R^1 represents a hydrogen atom or an alkyl, aralkyl, amino-alkyl, monoalkylamino-alkyl, dialkylamino-alkyl, acylamino-alkyl, phthalimido-alkyl, alkoxycarbonylamino-alkyl, aryloxycarbonylamino-alkyl, aralkoxycarbonylamino-alkyl, alkylaminocarbonylamino-alkyl, arylaminocarbonyl-aminoalkyl, aralkylaminocarbonylamino-alkyl, alkylsulphonylamino-alkyl or arylsulphonylamino-alkyl group, R^2 represents a carboxyl, alkoxycarbonyl or aralkoxycarbonyl group or a group of the formula



R^3 represents a carboxyl, alkoxy-carbonyl or aralkoxycarbonyl group, R^4 and R^5 each represent a hydrogen atom or R^4 and R^5 together represent an oxo group, R^6 and R^7 each represent a hydrogen atom or an alkyl or aralkyl group or R^6 and R^7 together with the nitrogen atom to which they are attached represent a 5-membered or 6-membered heteromonocyclic ring which may contain a further nitrogen atom or an oxygen or sulphur atom, and n is 2,

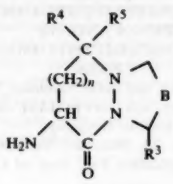
and pharmaceutically acceptable salts thereof.

25. A compound of the formula



wherein B represents an ethylene group, R^3 represents a carboxyl, alkoxycarbonyl or aralkoxycarbonyl group, R^4 and R^5 each represent a hydrogen atom or R^4 and R^5 together represent an oxo group, Hal represents a halogen atom and n is 2.

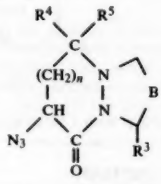
26. A compound of the formula



IV

wherein B represents an ethylene group, R^3 represents a carboxyl, alkoxycarbonyl or aralkoxycarbonyl group, R^4 and R^5 each represent a hydrogen atom or R^4 and R^5 together represent and oxo group and n is 2.

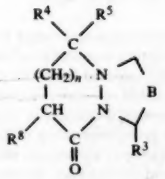
27. An azide of the formula



XV

wherein B represents an ethylene group, R^3 represents a carboxyl, alkoxycarbonyl or aralkoxycarbonyl group, R^4 and R^5 each represent a hydrogen atom or R^4 and R^5 together represent an oxo group and n is 2.

28. A compound of the formula



XVIIa

wherein B represents an ethylene group, R^3 represents a carboxyl, alkoxycarbonyl or aralkoxycarbonyl group, R^4 and R^5 each represent a hydrogen atom or R^4 and R^5 together represent an oxo group, R^8 represents a phthaloylamino group and n is 2.

4,512,925

1,23-DIHYDROXYVITAMIN D COMPOUNDS

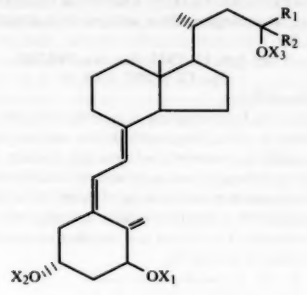
Hector F. DeLuca; Heinrich K. Schnoes, and Seok-Ho Lee, all of Madison, Wis., assignors to Wisconsin Alumini Research Foundation, Madison, Wis.

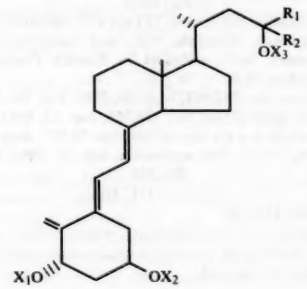
Filed Sep. 14, 1983, Ser. No. 531,964

Int. Cl.³ C07J 9/00

U.S. Cl. 260—397.2 **28 Claims**

1. Compounds selected from the group consisting of





wherein R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl, and where X_1, X_2, and X_3 are selected from the group consisting of hydrogen and acyl.

4,512,926

PROCESS FOR THE SILYLATION OF UNSATURATED, NATURALLY OCCURRING OILS OR THE INTERESTERIFICATION PRODUCTS THEREOF

Wolfgang Kampf, Haltern; Roland Streck, and Horst G. Haag, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,217

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3126845

Int. Cl.³ C07C 53/22, 57/00, 57/12

U.S. Cl. 260—398 **6 Claims**

1. A process for silylating an unsaturated, naturally occurring oil or an interesterification product thereof,

consisting essentially of reacting, at a temperature of 200°–350° C. and under an inert gas, the unsaturated, naturally occurring oil or an interesterification product thereof with a silicon compound of the formula

wherein

R is an unsaturated aliphatic hydrocarbon of 2–6 carbon atoms,

X is halogen, C_{1-6}-alkoxy, C_{1-6}-alkoxyalkoxy, C_{6-12}-aryloxy, C_{1-8}-alkanoyloxy, C_{1-6}-ketoximato or C_{1-8}-hydrocarbylamido,

Y and Z independently are one of the X groups, alkyl of 1–8 carbon atoms, cycloalkyl of 5–12 carbon atoms, or optionally substituted phenyl.

4,512,927
NAPHTHYL ESTERS FROM TETRALIN

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 15, 1983, Ser. No. 504,701
Int. Cl.³ C09F 5/08
U.S. Cl. 260—410.5 **8 Claims**

1. The process for preparing a member selected from the group consisting of naphthyl carboxylate and an indene carboxylate consisting essentially of reacting tetralin or indane respectively with oxygen and a carboxylic acid having from 2 to 19 carbon atoms at a temperature of from 120° C. to 200° C. in the presence of a catalyst which contains the elements Pd/Sb/M wherein M is at least one member selected from the group consisting of K and Cr.

4,512,928
PYROPHOSPHATO TITANATE ADDUCTS

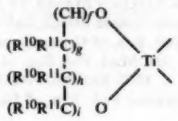
Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Division of Ser. No. 362,091, Mar. 26, 1982, Pat. No. 4,417,009, which is a division of Ser. No. 224,055, Jan. 12, 1981, Pat. No. 4,338,220, which is a division of Ser. No. 70,907, Aug. 29, 1979, Pat. No. 4,277,415. This application Jun. 21, 1983, Ser. No. 506,385
Int. Cl.³ C11C 3/02
U.S. Cl. 260—410.9 R **6 Claims**

1. A method of transesterifying esters which comprises adding to the reaction medium a catalytic amount of a compound having the formula

$$X_cTi[OP(O)(OR^1)OP(O)(OR^2)(OR^3)]_{4-c}(NR^4R^5R^6)_d[P(OR^7)(OR^8)(OR^9)]_e$$

wherein c is 1 or 2; d is 0, 1 or 2; e is 0, 1 or 2; with the proviso that d plus e must be 1 or 2; with the proviso that if c is 1, X must be RO—; and with the proviso that when c is 2, X is either RO— or a group which taken together with the Ti to which it is attached forms a ring having the formula



(VI)

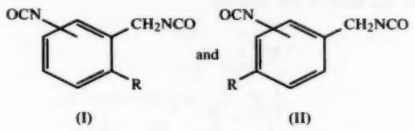
wherein each of f, g, h and i is 0 or 1, with the proviso that at least one of g, h and i is 1 and that the sum of f, g, h and i is 2 or 3; and wherein each R is independently selected from C_1 to C_{10} alkyl, C_3 to C_{10} alkenyl, C_7 to C_{10} dioxyalkylene; R^1, R^2, R^4, R^7, each R^{10} and each R^{11} are independently selected from hydrogen, C_6 to C_{10} aryl, C_7 to C_{20} aralkyl, C_1 to C_{20} alkyl, C_3 to C_{20} alkenyl, C_2 to C_{20} oxyalkylene and C_3 to C_{20} oligooxyalkylene, with the proviso that one and only one of R^1 and R^2 is hydrogen; R^5, R^6, R^8 and R^9 are independently selected from the same groups as are R^1, R^2, R^4, R^7, each R^{10} and each R^{11}, except that R^5, R^6, R^8 and R^9 may not be hydrogen, and, in addition, R^5 and R^6 are independently selected from C_1 to C_{10} alkanol, C_2 to C_6 alkanediol, C_7 to C_{10} aralkanol, substituted and unsubstituted C_1 to C_{10} alkyl, substituted and unsubstituted C_3 to C_{10} alkenyl, substituted and unsubstituted C_6 to C_{10} aryl, substituted and unsubstituted C_7 to C_{10} aralkyl, these last four groups being optionally substituted with 1 to 3 carboxylate groups or from 1 to 3 carboxamide groups, each such carboxylate group and each such carboxamide group being saturated or unsaturated and having from 1 to 5 carbon atoms; with the proviso that when aromatic carbons are present in any one of R, R^2, R^4, R^7, R^{10} or R^{11}, each of said carbons is optionally substituted with 1 or 2 independently selected halogen atoms.

4,512,929
1-ALKYL-2-ISOCYANATOMETHYL-ISOCYANATOBENZENES AND/OR 1-ALKYL-4-ISOCYANATOMETHYL-ISOCYANATOBENZENES

Erwin Hahn, Heidelberg, and Peter Neumann, Wiesloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,696
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212927
Int. Cl.³ C07C 119/048
U.S. Cl. 260—453 AR **9 Claims**

1. An aromatic diisocyanate having a formula selected from the group consisting of



(I) (II)

in which R is an alkyl group with 1 to 12 carbon atoms.

4,512,930
PROCESS FOR SYNTHESIZING CARBONIC ACID ESTERS DERIVED FROM UNSATURATED ALCOHOLS AND POLYHYDRIC ALCOHOLS

Ugo Romano, Vimercate, Italy, assignor to ANIC, S.p.A., Palermo, Italy

Filed Apr. 26, 1982, Ser. No. 371,670
Claims priority, application Italy, May 21, 1981, 21884 A/81
Int. Cl.³ C07C 68/06
U.S. Cl. 260—463 **8 Claims**

1. A process for synthesizing unsaturated bis-carbonates of polyhydric alcohols consisting essentially of the step of reacting an unsaturated alcohol selected from the group consisting of allyl alcohol, allyl carbinol, methallyl alcohol, crotyl alcohol, 3-buten-2-ol and 2-methyl-3-buten-2-ol with an alkyl carbonate selected from the group consisting of dimethyl carbonate, diethyl carbonate, dipropyl carbonate, dibutyl carbonate and dibenzyl carbonate and a polyhydric alcohol selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, butanediol, hexanediol, neopentyl glycol, glycerol, trimethylol propane, and pentaerythritol or a combination thereof, wherein the molar ratio of unsaturated alcohol to polyhydric alcohol is between about 2 and and about 40 and the molar ratio of said unsaturated alcohol to said alkyl carbonate is between about 2 and about 10, said reaction taking place in the presence of an alkaline catalyst selected from the group consisting of sodium hydroxide, sodium carbonate and organic bases.

4,512,931
INSECTICIDAL PRODUCT AND PREPARATION THEREOF

Michael J. Robson, Bracknell, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 26, 1983, Ser. No. 535,625
Claims priority, application United Kingdom, Oct. 18, 1982, 8229724
Int. Cl.³ C07C 121/75
U.S. Cl. 260—465 D **6 Claims**

1. A process for the relative enrichment of a solution of α-cyano-3-phenoxybenzyl 3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate with respect to the enantiomeric pair of isomers represented by (S)-αcyano-3-phenoxybenzyl (1R,cis)-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate and (R)-α-

cyano-3-phenoxybenzyl (1S,cis)-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate which comprises subjecting a solution comprising the enantiomeric pair of isomers (R)-α-cyano-3-phenoxybenzyl (1R,cis)-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate and (S)-α-cyano-3-phenoxybenzyl (1S,cis)-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate in an organic solvent to the action of a base to effect epimerisation.

4,512,932

WATER REMOVAL OF TRIMETHYL PHOSPHATE FROM PHOSPHORUS CONTAINING PESTICIDES

Dale E. Lyman, Bumpass, and James J. Anderson, Richmond, both of Va., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,824
Int. Cl.³ C07F 9/09
U.S. Cl. 260—990 **13 Claims**

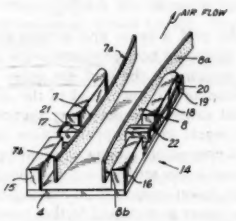
1. A method for treating a liquid phosphorus containing pesticide manufactured from trimethyl phosphite having limited water solubility and containing trimethyl phosphate (TMPO) comprising extracting the TMPO by contacting said pesticide with water until the pesticide raffinate contains less than 1000 ppm TMPO.

4,512,933

APPARATUS FOR DISPENSING VOLATILE SUBSTANCES

Theodore A. Harden, Middletown, N.Y., assignor to Takasago USA, Inc., Rockleigh, N.J.

Filed Dec. 9, 1983, Ser. No. 559,791
Int. Cl.³ B01F 3/04
U.S. Cl. 261—30 **20 Claims**



1. An apparatus for dispensing volatile substances, comprising a housing, a piezoelectric element having one end mounted to the housing and one end free, a generally planar impeller blade connected to the free end of the piezoelectric element and having its distal end unconstrained by the housing, means for detachably mounting a replaceable substrate cartridge containing a volatile substance in proximity to the distal end of the impeller blade, and means for applying a voltage to the piezoelectric element for oscillating its free end perpendicular to its plane at or close to resonance and propagating a traveling wave along the blade to generate and shed vortices at the distal end of the blade, such that the vortices contact the substrate cartridge, thereby dispensing the volatile substance.

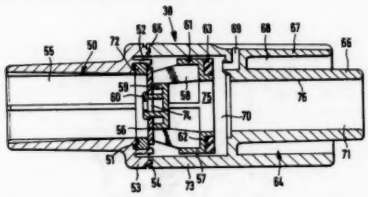
4,512,934

AIR BUBBLE HYDROMASSAGING APPARATUS

Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,703
Int. Cl.³ B01F 3/04
U.S. Cl. 261—64 B **20 Claims**

1. Air bubble hydromassaging apparatus comprising a blower housed in a control unit, a bubble grid adapted to be placed into a bathtub, and air tubing enclosing a check valve to connect said control unit to said bubble grid, said control unit being provided with a bushing type compressed air outlet and said bubble grid being provided with a bushing type compressed air inlet, said air tubing having a first connector fitting on one end and a second connector fitting on the opposite end by which it is detachably and airtightly connectible to said compressed air outlet of said control unit and said compressed air inlet of said bubble grid, respectively, and said check valve being housed in said first connector fitting and serving to obstruct passage through said connector fitting when said blower is in an OFF condition and to permit passage through said connector fitting when said blower is in an ON condition, characterized in that said check valve is housed in said first



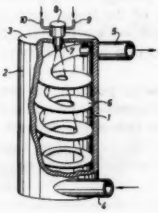
connector (**38**) on the side facing said control unit (**10**), said first connector (**38**) being connectible in an airtight relation solely to said compressed air outlet (**14**) of said control unit (**10**), that said second connector (**43**) on the side facing said bubble grid (**25**) is connectible in an airtight fashion solely to said compressed air inlet (**28**) of said bubble grid (**25**), that said check valve comprises permanent magnet (**72**) which in the inoperative condition of said blower retains valve plunger (**61**) which blocks the passage through said connector (**38**), and that in the operative condition of the blower said valve plunger (**61**) is lifted from said magnet (**72**) by the force of the compressed air exiting from said compressed air outlet (**14**) of said control unit (**10**) to permit passage through said connector (**38**).

4,512,935

APPARATUS FOR THE VOLATILIZATION OF A LIQUID

Anders Hilmersson, Helsingborg; Jan Lagerstedt, Malmö, and Helge Andersson, Lund, all of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Jan. 13, 1984, Ser. No. 570,491
Claims priority, application Sweden, Jan. 25, 1983, 8300356
Int. Cl.³ A61L 2/22
U.S. Cl. 261—79 A **3 Claims**



1. An apparatus for volatilizing a liquid by blending the liquid with a heated gas comprising a casing having a chamber provided with feed and discharge lines for the gas so as to impart a circulating movement to the gas and, a helical shaped guide rail positioned inside said chamber and a nozzle to introduce the liquid as droplets into the circulating movement of the gas along a center axis of said helical shaped guide rail, wherein the helical guide rail is provided with a centrally located conical opening which widens in a direction opposite

the nozzle, the centrally located conical opening provided with a cone angle substantially corresponding to a spreading angle imparted to said droplets by said nozzle.

4,512,936

AERATION APPARATUS

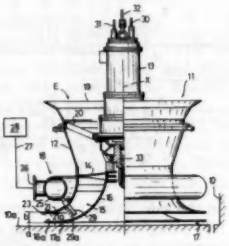
Masao Oshima; Yutaka Kato; Mitsuhiko Ogasawara, and Osamu Futamura, all of Tokyo, Japan, assignors to Ebara Corporation and Ebara-Infilco Co., Ltd., both of, Japan

Filed Jun. 30, 1982, Ser. No. 393,723

Claims priority, application Japan, Jul. 3, 1981, 56-103279; Jul. 7, 1981, 56-105066; Mar. 1, 1982, 57-30541

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—93 **22 Claims**



1. An aeration apparatus comprising:

a generally tubular outer casing including an axis generally extending in a substantially vertical direction;

driving means mounted in said outer casing;

an impeller adapted to be driven by said driving means so as to feed a liquid to be treated in a substantially axially and downwardly direction;

an inner casing disposed at the inner side of said outer casing at a predetermined distance from the latter so as to form an annular discharge passage for said liquid; and

gas supplying means having gas discharge ports positioned in said discharge passage for supplying an oxygen-containing gas to said liquid in said annular discharge passage;

wherein said annular discharge passage defined by said outer casing and said inner casing has an outlet end opening substantially radially outwardly in a direction substantially perpendicular to said axis,

said liquid is sucked through one end of said outer casing and discharged through said outlet end,

said discharge passage is defined between said outer casing and said inner casing disposed coaxially with said outer casing,

said discharge passage being gradually curved in the direction of flow of the liquid therethrough from a direction substantially downwardly and substantially parallel to said axis to a direction substantially perpendicular to said axis, and

said gas discharge ports being disposed in such a region between said impeller and said outlet end of said discharge passage that the angle formed between the meridian streamline of the liquid flow through said discharge passage and the horizontal is in the range of between about 0° and 60°.

4,512,937

GRID AND FILL SLATS FOR COOLING TOWERS

Paul D. Hoffmann, Kirkwood, Mo., assignor to Lilie-Hoffman Cooling Towers, Inc., St. Louis, Mo.

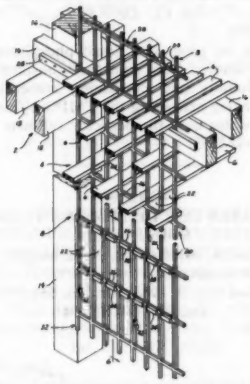
Filed Jan. 3, 1983, Ser. No. 455,027

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—111 **19 Claims**

1. A fill arrangement for a cooling tower, said fill arrangement comprising grids positioned vertically with each grid including horizontal and vertical stringers which delineate openings in the grid, the grid being formed from a polymer; slats extended through at least some of the openings in the grids, each slat being supported on the lower horizontal stringer for the opening through which it extends, at least some of the slats being formed entirely from a polymer that is extruded, the extruded polymer slats being hollow and rectangular in cross-sectional configuration, with each including a generally flat top wall, a generally flat bottom wall, and side walls connecting the top and bottom walls along the sides of those walls and also a web connecting the top and bottom walls intermediate the side walls.

13. In a cooling tower having a fill formed from a multiplicity of slats, an improved grid for supporting slats of the fill, said grid comprising: an upper grid section formed from a polymer and including horizontal and vertical stringers which define



openings in the grid; a lower grid section also formed from a polymer and including horizontal and vertical stringers which define more openings in the grid, the upper end of the lower section overlapping the lower end of the upper section such that horizontal stringers in the lower section are adjacent to horizontal stringers in the upper section at more than one elevation; and connectors joining adjacent horizontal stringers of the upper and lower sections together, with each connector preventing the lower section from moving downwardly with respect to the upper section and further preventing the lower section from moving laterally away from the upper section, the connectors being arranged at least in two elevations in the overlapping regions of the upper and lower sections, whereby the lower section is firmly attached to the upper section to form a downward extension of the upper section.

4,512,938

UNDULATING HEAT EXCHANGE PACKING

Bryan E. Jones, Feltham, and Anthony M. Kunesch, Great Bookham, both of England, assignors to Film Cooling Towers Limited, Richmond, England

Filed Jul. 14, 1982, Ser. No. 398,149

Claims priority, application United Kingdom, Jul. 16, 1981, 8121868; Jul. 16, 1981, 8121913

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—112 **6 Claims**

1. A heat exchange packing comprising:

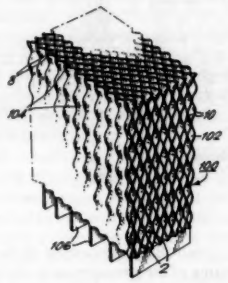
a plurality of packing sheets arranged in parallel, vertical upright, face to face relationship,

each of said packing sheets having a first waveform extending substantially transversely and a second waveform extending substantially longitudinally thereof,

said packing sheets being arranged adjacent to each other and being held in contact with each other at predetermined points, such that a plurality of substantially trans-

versely extending channels and a plurality of substantially vertically extending channels are defined within the packing,

and wherein each of said packing sheets has a third waveform extending substantially within the plane of the sheet



and at angles with respect to said transversely and longitudinally extending first and second waveforms, respectively, such that said first, second and third waveforms define a spiral channel formed around each of said substantially vertically extending channels.

4,512,939

METHOD FOR MANUFACTURING OXIDIC SINTERED NUCLEAR FUEL BODIES

Wolfgang Dörr, Herzogenaurach; Gerhard Gradel, Eckersdorf; Martin Peehs, Bubenreuth; Reinhard Schäfer, Rodenbach, and Thomas Sondermann, Kahl, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim and Reaktor Brennelement Union GmbH, Hanau, both of, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,615

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144684

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 **12 Claims**

1. In a method for the manufacture of oxidic sintered nuclear fuel bodies by compacting UO_2-starting powder or a mixture of UO_2 and PuO_2 starting powder which contains up to 10% by weight rare-earth oxide as an additive into blanks and subsequent densification of these blanks by a heat treatment in a sintering atmosphere with reducing action, the improvement comprising compacting UO_2-starting powder which has at least one of the two properties consisting of a specific surface in the range of 2 to 4.5 m^2/g and a mean crystallite diameter in the range of 80 nm to 250 nm, and carrying out the heat treatment in the sintering atmosphere with reducing action at a temperature in the range of 1,500° C. to 1,750° C.

4,512,940

METHOD AND APPARATUS FOR THE PRODUCTION OF ELECTRET MATERIAL

Jeff L. Anderson, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 16, 1982, Ser. No. 450,311

Int. Cl.³ H01G *7/02*; B29D *7/22*

U.S. Cl. 264—22 **5 Claims**

1. The method of polarizing a dielectric material to form an electret which includes the steps of:

positioning spaced-apart first and second electrodes adjacent the same surface of the dielectric material;

connecting the electrodes to a source of voltage with each electrode having an opposite polarity enabling the electrodes to apply an electrical field to the longitudinal area of the dielectric material located between the electrodes;

locating a source of radiant energy spaced from and between the electrodes;

applying the radiant energy on the dielectric material polarized by the electrical field;

and moving the electrodes and the source of radiant energy along the same surface of the dielectric material at a rate of speed enabling the polarized area of the dielectric material to return to its initial temperature upon reaching the second electrode.

3. An apparatus for producing an electret comprising:

a movable support member positioned adjacent a sheet of dielectric material which exhibits a residual polarization after being subjected to a polarization-enabling energy and to a polarizing electrical field;

a pair of spaced-apart electrode members mounted on said support member and positioned adjacent the same surface of the dielectric material;

a source of voltage connected to said electrode members enabling the electrode members to be of opposite polarity for applying a polarizing electrical field along the longitudinal axis of the dielectric material in the area located between said electrode members;

a source of polarizing-enabling energy mounted on said movable support member;

and means for directing said polarizing-enabling energy on the longitudinal area of the sheet of dielectric material located between the electrode members enabling the dielectric material to exhibit a residual polarization.

4,512,941

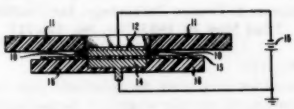
POLARIZING OF PIEZOELECTRIC MATERIAL

Heinz von Seggern, Westfield, and Tsuey T. Wang, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 14, 1983, Ser. No. 466,771

Int. Cl.³ B29D *7/20*

U.S. Cl. 264—22 **16 Claims**



1. A method of polarizing a sheet of polarizable material by steps comprising applying an electric field across a portion of said sheet

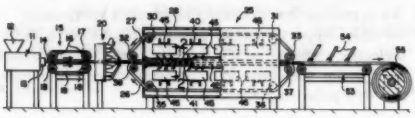
characterized in that

at least during said polarizing, at least one edge of said sheet is insulated from said portion by steps comprising pressing a compliant dielectric onto said sheet between said portion and said edge, whereby the voltage that can be applied to said sheet without breakdown is substantially increased.

4,512,942
METHOD AND APPARATUS FOR VULCANIZING HOSE

William R. Babbin, Barberton, and James W. Messerly, Stow, both of Ohio, assignors to B. F. Goodrich Company, New York, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,937
Int. Cl.[3] B29H 5/01
U.S. Cl. 264—26 6 Claims



1. A process for vulcanizing a continuous length of reinforced rubber hose which comprises the steps of advancing a continuous length of hose to a pair of endless moving belt molds that are cooperative on merging to encompass such hose and with said belt molds being made of material transparent to microwave energy, advancing said hose while captively held by said moving belt molds between pressure applying guides that are transparent to microwave energy, applying pressure to said hose through the cooperative action of said guides applying pressure on said belt molds, exposing said encompassed hose to microwave energy to effect vulcanization of said hose, advancing said belt molds out of contact with said guides to remove pressure on said hose, and parting said moving belt molds from said hose while directing said vulcanized hose therefrom for windup.

4. An apparatus for vulcanizing elastomeric articles comprising, an elongated chamber, said chamber having an entrance end and an exit end, a pair of endless conveyor belts having a pair of merging conveying runs operative in said chamber for movement along a longitudinally extending pass line, said conveyor belts being transparent to microwave energy, microwave energy transmitting devices mounted in said chamber on opposite sides of said pass line, each of said conveyor belts having a continuous recess which is operative to receive an elastomeric uncured article at said entrance end to confine said elastomeric article as said article moves through said chamber drive means connected to said belts for moving said conveyor belts in their endless path, (and) means for energizing said microwave devices to transmit microwave energy towards said conveying runs to effect vulcanization of elastomeric articles confined in said recesses as it moves through said chamber, and said chamber has guide means therein operative to exert pressure on said pair of merging conveying runs along said pass line to maintain pressure on said elastomeric article confined therein during vulcanization thereof.

4,512,943
EXTRUSION PROCESS FOR PRODUCING THERMOPLASTIC PIPE

Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

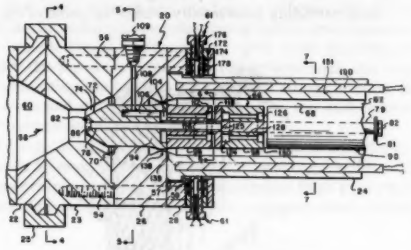
Filed May 20, 1983, Ser. No. 496,712
Int. Cl.[3] B29F 3/08
U.S. Cl. 264—173 2 Claims

1. A process for producing thermoplastic pipe comprising:

(a) transporting an annular stream of thermoplastic material through an annular extrusion passageway, a downstream annular portion of the extrusion passageway having a radially movable outer wall;

(b) radially moving the outer wall by heat expansion of an element thereagainst to change the thickness of an arcuate section of the stream;

(c) selectively heating an arcuate section of the passageway to change the final extruded thickness of the stream of thermoplastic material transported in proximity to the heated section, the selectively heated section positioned diametrically across the annular passageway from the section of the outer wall expanded against; and

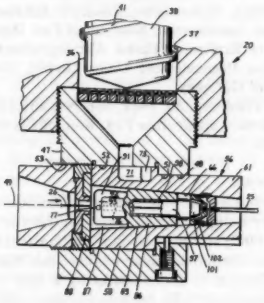


(d) commonly controlling the heating of the expansion element and the heating of the passageway to change the resulting thickness of an arcuate section of the stream.

4,512,944
METHODS OF AND APPARATUS FOR INSULATING A CONDUCTOR WITH A PLASTIC MATERIAL

Greg Astfalk, Levittown, Pa.; Timothy S. Dougherty, Roswell, Ga., and Montri Viriyayuthakorn, Trenton, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 23, 1983, Ser. No. 507,262
Int. Cl.[3] B29F 3/10
U.S. Cl. 264—174 16 Claims



1. A method of extrusion covering a conductor with a plastic material, said method comprising the steps of:

advancing a conductor along a path of travel through a core tube which is positioned in a cavity of a die and through a passageway which connects the cavity with an exit orifice of the die;

providing a supply of a plastic material at a location which is spaced from the path of travel; and

causing the plastic material to be moved from the supply radially inwardly toward the conductor through a disc-like flow passage which is disposed concentrically about and perpendicularly to the path of travel, the flow passage having a width which is sufficiently small to minimize the distance along the path of travel through which the core tube can be moved before it engages a wall that defines the die and a length which is normal to the path of travel and which cooperates with the width to provide a uniform distribution of the plastic material circumferentially about the conductor adjacent to its entrance into the passageway and to dissipate stresses which have been induced in the plastic material.

8. An apparatus for extrusion covering a conductor with a plastic material, said apparatus comprising:

a die which includes a cavity and an exit orifice which communicates with said cavity through a passageway;

a core tube which is positioned within said die cavity;

moving means for advancing a conductor along a path of travel through the core tube, past an entrance of said passageway and through said passageway and said exit orifice of said die;

means for providing a supply of a plastic material at a location which is spaced from the path of travel; and

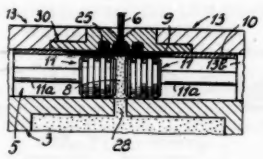
passage means for causing the plastic material to be directed from the supply radially inwardly toward the conductor, said passage means being disposed concentrically about and perpendicularly to the path of travel and having a width which is sufficiently small to minimize the distance along the path of travel through which the core tube can be moved before it engages a wall that defines the die and a length normal to the path of travel, the length and width being sufficient to provide a uniform distribution of the plastic material circumferentially about the conductor adjacent to the entrance of said passageway and to dissipate stress which have been induced in the plastic material.

4,512,945

DEVICE AND METHOD FOR SPREAD APPLYING LIQUIDS, IN PARTICULAR GLUE OVER BOOK SPINES

Giovanni Viganó , Milan, Italy, assignor to PLASTIVER S.a.s. di Giovanni e Vittorio VIGANO & C., Ciserano-Zingonia, Italy

Filed Feb. 22, 1984, Ser. No. 582,478
Claims priority, application Italy, May 19, 1983, 21182 A/83
Int. Cl.[3] B32B *3/00*
U.S. Cl. 264—263 **13 Claims**



1. A device for spread-applying liquids, in particular glue over the spines of books, comprising glue storage members, glue extruder members having a plurality of nozzles, and means of entraining and guiding said books adapted to move said books past said extruder members, with said spines facing said nozzles, characterized in that said extruder members comprise: at least one reservoir chamber in communication with said nozzles, at least one pressure element adapted to diminish and alternately augment the internal volume of said reservoir chamber, and at least one pair of containment lateral sides extending alongside the path of movement of said spines and defining a chamber located on the opposed side to said reservoir chamber relatively to said nozzles and adapted to receive both said spine of a book and adjacent edges thereof, and in that said containment lateral sides are movable toward and away from each other under control by a drive member and are engaged with said pressure element and movable together with said pressure element.

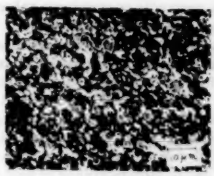
11. A method of spread-applying liquids, in particular glue over the spines of books, comprising an irrigation step carried out by extrusion, and characterized in that at the time of extrusion the area to be impregnated is enclosed between containment lateral sides, and in that said irrigation step by extrusion is alternated with a suction step, said steps being carried out by compressing and expanding a reservoir chamber containing said liquid.

4,512,946

MICROCOMPOSITE OF METAL BORIDE AND CERAMIC PARTICLES

Milivoj K. Brun, Ballston Lake; Minyoung Lee, and Lawrence E. Szala, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,784
Int. Cl.[3] C04B *35/60*
U.S. Cl. 264—332 **14 Claims**



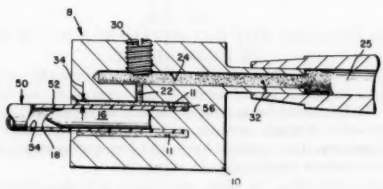
1. A process for producing a polycrystalline microcomposite consisting essentially of a continuous interconnecting phase of a boride of a metal selected from the group consisting of hafnium, niobium, tantalum, titanium, vanadium, zirconium and mixtures thereof and a phase of ceramic particles, said phases being distributed at least significantly uniformly in said microcomposite, said microcomposite having a density greater than 95% of the theoretical density for said microcomposite, which consists essentially of forming a particulate mixture of boron, a hydride of a metal selected from the group consisting of hafnium, niobium, tantalum, titanium, vanadium, zirconium and mixtures thereof, and a ceramic powder, hot pressing the particulate mixture under a pressure of at least about 200 psi at a temperature ranging from about 1200° C. to about 2000° C. decomposing said hydride of said metal producing said metal and by-product gas which vaporizes away and reacting said metal with said boron producing the boride of said metal as a continuous interconnecting phase, said continuous metal boride phase encapsulating at least about 20% by volume of said ceramic particles and either encapsulating or being intermixed with the balance of said ceramic particles, said process having no significant effect on said ceramic particles, said continuous interconnecting metal boride phase ranging from about 20% by volume to about 80% by volume of said microcomposite and the balance of said microcomposite consisting essentially of particles of said ceramic.

4,512,947

METHOD AND APPARATUS FOR APPLYING SOLVENT TO TUBING, OTHER CYLINDRICAL OBJECTS OR OTHER FLEXIBLE MATERIAL

Charles Wyle, Los Angeles, and Donald M. Shea, Torrance, both of Calif., assignors to Charles Wyle Engineering Corporation, Torrance, Calif.

Filed May 5, 1983, Ser. No. 491,740
Int. Cl.[3] B29C *27/00*
U.S. Cl. 264—343 **40 Claims**



1. An apparatus for applying a solvent to the external surface of an object comprising:

a. a housing member;
b. a longitudinal internal chamber extending within said housing member;
c. the cross-section of said internal chamber being slightly larger than the cross-section of said object to which solvent will be applied;
d. the surface of said internal chamber containing a hole;
e. said housing member further containing a reservoir feed chamber which is connected to a supply reservoir;
f. a passage connecting said reservoir feed chamber to said hole in the surface of said internal chamber; and
g. said supply reservoir containing a solvent;
h. whereby when said object is inserted into said internal chamber, said solvent is fed under pressure by feeding means from said supply reservoir to said reservoir feed chamber, then through said passage and out said hole in the surface of said internal chamber and onto the external surface of said object such that capillary action resulting from the close distance between the object and internal chamber wall will cause said solvent to spread along and around the entire circumference of said object in the area adjacent said hole.

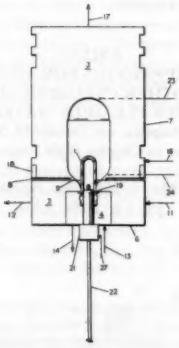
17. The method of applying solvent to the external surface of an object comprising:
a. inserting said object into a chamber contained within a housing member such that only a small gap exists between the external surface of the object and the internal surface of said chamber; and
b. feeding solvent under pressure from a supply reservoir to an opening in the surface of said chamber such that solvent is spread onto the external surface of said object;
c. whereby capillary action resulting from the close distance between the object and internal chamber surface will cause said solvent to spread along and around the entire circumference of said object in the area adjacent said opening.

4,512,948

METHOD FOR MAKING POLY(ETHYLENE TEREPHTHALATE) ARTICLE

Saleh A. Jabarin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 3, 1982, Ser. No. 354,473
Int. Cl.[3] B29C *17/07*
U.S. Cl. 264—521 7 Claims



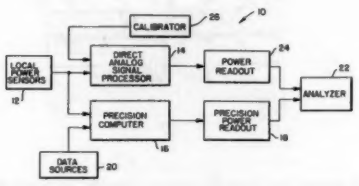
1. A method for making a high density, partially crystalline, biaxially oriented, heat set, polyethylene terephthalate hollow container, the container having a body with oriented sidewalls, the method comprising the steps of:
A. providing by blow molding a hollow article with oriented sidewalls,
B. while the article is still under a shrinkage reducing pressure, increasing the density of the oriented sidewalls to at least about 1.391 g/cc by heating the sidewalls to a heat setting temperature equivalent to a temperature of about 220° C. to 250° C. to provide the density of at least about 1.391 g/cc,
C. quenching the sidewalls while still under a shrinkage reducing pressure to provide the article with a shrinkage of less than about 5% of the volume and an onset of shrinkage temperature of at least about 105° C., the quenching being done at a temperature equivalent to that of about room temperature to 180° C. at a high heat setting temperature of 240° C., about 85° to 160° C. for a heat setting temperature of about 230° C., and about 120° C. to 150° C. for a lower heat setting temperature of about 220° C.

4,512,949

POWER PERFORMANCE MONITORING SYSTEM FOR NUCLEAR REACTOR FUEL CORE

Robert D. Smith, Bethesda, Md., assignor to Scandpower, Inc., Bethesda, Md.

Division of Ser. No. 229,797, Jan. 30, 1981, Pat. No. 4,411,858.
This application Jul. 7, 1983, Ser. No. 511,683
Int. Cl.[3] G21C *17/00*
U.S. Cl. 376—247 2 Claims

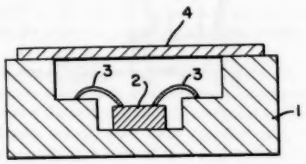


1. An electrical system for monitoring power developed in a nuclear reactor comprising:
sensors which generate heat in response to gamma radiation from fission products further generating electrical signals that are directly related to linear power generation rate of the fuel rods in said reactor;
a direct analog signal processor receiving said electrical signals from said sensors, said direct analog signal processor being controlled by an on line calibrator;
a precision computer receiving the same said electrical signals from said sensors, said precision computer having access to stored data sources on individual sensor precalibration and reactor condition parameters, said precision computer processing said signals and data into correct precision power signals;
a continuous power readout receiving an analog signal from said direct analog signal processor;
a precision power readout receiving a precision power signal from said precision computer; and
an analyzer which receives signals from said precision power readout and said continuous power readout for converting said signals to fuel failure forecasts and power distribution recommendations for failure avoidance purposes.

4,512,950
LEAD ALLOY SOFT SOLDER CONTAINING RADIOACTIVE PARTICLES USED TO MAKE MORE RELIABLE SEMICONDUCTOR DEVICES

Naoyuki Hosoda, Osaka; Naoki Uchiyama, and Ryusuke Kawanaka, both of Toyonaka, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

PCT No. PCT/JP83/00065, § 371 Date Oct. 31, 1983, § 102(e) Date Oct. 31, 1983, PCT Pub. No. WO83/03163, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 2, 1983, Ser. No. 552,038
Claims priority, application Japan, Mar. 2, 1982, 57-32678
Int. Cl.³ B32D *15/02*
U.S. Cl. 420—563 2 Claims

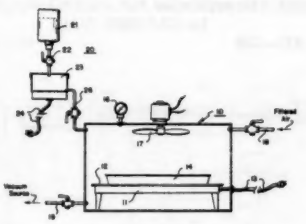


1. A soft solder of Pb alloy for semiconductor devices that contains 1 to 65 wt% of Sn or In or both, the balance being Pb and incidental impurities which include less than 50 ppb of radioisotopes and the count of radioactive alpha-particles being not more than 0.5 CPH/cm^2.

4,512,951
HYDROGEN PEROXIDE LIQUID FILM STERILIZATION METHOD

Edward Koubek, Annapolis, Md., assignor to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 358,435, Mar. 15, 1982, abandoned, which is a continuation of Ser. No. 221,426, Dec. 30, 1980, abandoned. This application Aug. 4, 1983, Ser. No. 520,146
Int. Cl.³ A01N *1/00*
U.S. Cl. 422—33 7 Claims

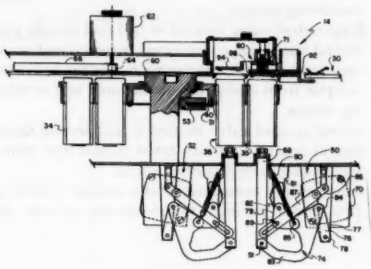


1. A method of liquid-contact sterilization which comprises:
vaporizing from an aqueous solution of hydrogen peroxide a gaseous vapor consisting of hydrogen peroxide and water vapor;
passing the said gaseous vapor into an evacuated sterilization zone and into contact therein with an article to be sterilized;
maintaining the article at a temperature below the dew point of the entering vapor so that aqueous hydrogen peroxide solution is condensed out of that said vapor in contact with the said article as a layer of liquid thereon; and
maintaining the said film of liquid on the article for a predetermined period to effect sterilization of the article.

4,512,952
APPARATUS FOR STORING AND DISPENSING ANALYSIS SLIDES

Douglass L. Blanding, Rochester, and Martin F. Muszak, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,193
Int. Cl.³ G01N *35/00*
U.S. Cl. 422—63 11 Claims



1. In a chemical analyzer for measuring a characteristic of a sample fluid wherein the fluid is deposited on an analysis slide which is analyzed after an appropriate period of time, the analyzer including
means for supporting a plurality of stacks of slides adjacent each other, each of said stacks having a longitudinal axis;
means for removing a slide from a selected stack, said removing means being movable along a path generally transverse to said axes; and
means for positioning said selected stack and said removing means relative to each other and to said supporting means such that a slide from the selected stack is in a position to cooperate with said removing means;
the improvement wherein
(a) said supporting means mounts said stacks in concentric rings with said slides of each stack being movable into and out of the plane of said removing means path, at least some of the stacks of one of said rings being positioned so that, when such one ring stacks are moved into the plane of said removing means path, they block the slides of a stack of the other ring from being removed by said removing means,
(b) said positioning means comprise means for selectively moving said selected stacks into the plane of said path,
(c) and movably mounted track means are cooperatively positioned with respect to the stacks of said one ring to provide a pathway for removal of slides from the stacks of said other ring when said one ring stacks are moved out of the plane of said removing means path, said track means being mounted to move along the same axis as, and in response to the movement of, said stacks of said one ring.

4,512,953
ANALYZING APPARATUS FOR THE ANALYSIS OF LIQUID SAMPLES

Hermann Marsoner; Christoph Ritter, both of Graz; Erich Kleinhappl, Kumberg, and Winfried Strutz, Graz, all of Austria, assignors to AVL AG, Schaffhausen, Switzerland

Filed May 21, 1982, Ser. No. 380,874
Claims priority, application Austria, May 25, 1981, 2343/81
Int. Cl.³ G01N *35/00, 35/08*
U.S. Cl. 422—67 3 Claims

1. An analyzing apparatus for the analysis of liquid samples which comprises
a measuring means for measuring properties of liquid sam-

ples supplied thereto and for providing measurement signals representative of the measured properties,

an evaluation unit to which said measurement signals are fed, said evaluation unit acting to evaluate said measurement signals and display the evaluated results,

a sample input device, said sample input device including a single sample input unit and a serial sample input unit,

a first sample pipe connected between said single sample input unit and said measuring means for conveying single liquid samples from said single sample input unit to said measuring means,

a first control valve located in said first sample pipe,

a second sample pipe connected between said serial sample input unit and said measuring means for conveying liquid samples from said serial sample input unit to said measuring means,

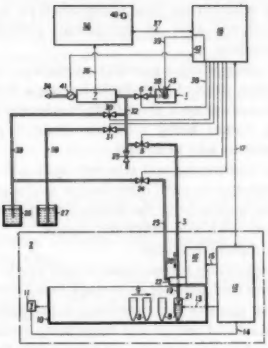
a second control valve located in said second sample pipe,

a central control unit connected to said first control valve and to said second control valve,

a switch means connected to said central control unit, and

a first sensor positioned downstream of said measuring means for sensing the passage of each liquid sample through said measuring means and concurrently sending a corresponding first signal to said central control unit,

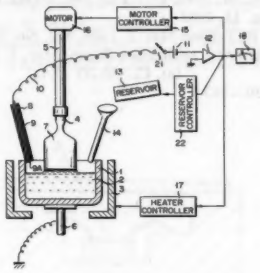
said central control unit having a first operative mode wherein it generates a second and third signal to respectively close said first control valve and open said second control valve to allow only liquid samples from said serial sample input unit to pass to said measuring means and a second operative mode wherein it generates a fourth and fifth signal to respectively close said second control valve and open said first control valve to allow only liquid samples from said single sample input unit to pass to said measuring means, and said switch means, when activated, generates a sixth signal to activate said central control unit to generate a seventh signal to stop the placing of liquid samples from said serial sample input unit into said second sample pipe and to change from said first operative mode to said second operative mode when said central control unit receives an eighth signal from said first sensor that all liquid samples which were in said second sample pipe when said switch means was activated have passed said measuring means.



4,512,954
CRYSTAL GROWING APPARATUS

Toshiro Matsui, Hyogo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 10, 1983, Ser. No. 521,826
Claims priority, application Japan, Aug. 19, 1982, 57-143707
Int. Cl.³ C30B *15/20*
U.S. Cl. 422—106 **4 Claims**



1. A crystal growing apparatus for growing a crystal by preparing a crystal raw material melt in a crucible, bringing a seed crystal into contact with the melt and pulling the seed crystal, comprising:

an electrode arranged above the melt at a distance therefrom,

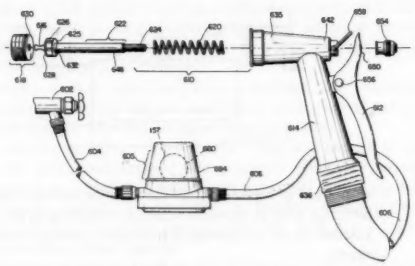
means for detecting a change in a resistance of an atmosphere between said electrode and the melt, and

means for controlling a pulling speed of the crystal in accordance with a detection output from said detecting means, thereby controlling a dimension of the crystal.

4,512,955
APPARATUS FOR WATER TREATMENT

Kenji Etani, P.O. Box 188, West Townsend, Mass. 01474

Continuation-in-part of Ser. No. 40,302, Apr. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Feb. 18, 1982, Ser. No. 349,920
Int. Cl.³ B05B *7/24*
U.S. Cl. 422—266 **10 Claims**



1. Apparatus for adding chemicals in small amounts to water comprising:

a. a supply of water at main pressure,

b. an intermediate-velocity chamber,

c. a water delivery device,

d. a hose between said supply and said chamber,

e. a conduit between said chamber and said device,

f. a feeder in the form of a compact, stiff but flexible shell of

waterproof plastic of substantially neutral bouyancy adapted to be contained within said chamber, and

g. a dose of said chemical within said feeder, wherein:

(i) said supply, hose, chamber, conduit, and device are interconnected to comprise a water-and-pressure-tight channel from said supply through said hose, chamber, conduit, and device, and

(ii) said feeder is perforated by a number of small feed holes, selected to have a number, size, and distribution to provide a desired rate of feeding of said chemical, and is small enough and close enough to spherical in shape and to neutral bouyancy so that a normal flow rate through said chamber said feeder is free randomly to turn and move about, thereby to feed said chemical proportionately to said rate, wherein

(iii) said device is a nozzle providing quick-acting control and cut-off of the flow of water through said channel,

(iv) said feeder encloses trapped within it a bubble of gas, and

(v) the amount of said entrapped gas, and the size of said feed holes is selected to control water hammering, and to provide a desired size shot of chemical to the target area of said nozzle with each cycle of said control, thereby providing a second mode of operation of the feeder.

4,512,956

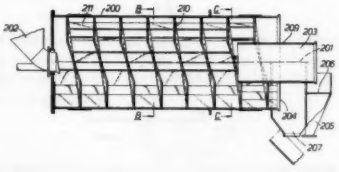
DIGESTER

Lee F. Robinson, 3 Athenaeum Hall, Vale of Health, London NW3 1AP, England; Francesco Salimbeni, Riva A Caccia 1, 6900 Lugano, Switzerland; Guiliano Porcari, 17, Via F. 20R21, 6900 Paradiso, Switzerland, and Mario Dente, Corso Sempione 38, Milan, Italy

Continuation-in-part of Ser. No. 330,600, Dec. 13, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,168

Int. Cl.³ B01D *11/02*

U.S. Cl. 422—270 **12 Claims**



1. A rotary digester for digesting solids comprising:

an outer shell;

means for entry of liquids and solids to be digested at one end of the shell;

a tubular, axially extending outlet at the other end of the shell for discharge of liquids;

a solids outlet at the same end as said liquids outlet, surrounding, but separated from, the liquids outlet; and

a screw which surrounds the tubular liquids outlet to urge solids to and through the solids outlet, which screw is secured at its outer periphery to the shell.

4,512,957

METHOD FOR THE SEPARATION OF URANIUM ISOTOPE COMPOUNDS ALREADY CONVERTED ISOTOPE-SELECTIVELY

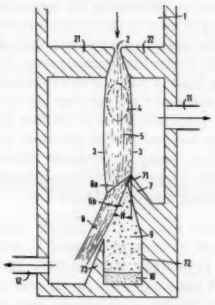
Hans-Joachim Niemann, and Josef Sprehe, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 92,643, Nov. 8, 1979, abandoned. This application Oct. 21, 1981, Ser. No. 313,617

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850648

Int. Cl.³ B01D *59/00;* **C01G** *43/06*

U.S. Cl. 423—3 **1 Claim**



1. Method for the separation of $U^{235}F_5$ within a gas jet having supersonic velocity and which gas jet contains a carrier gas, a reaction partner, gaseous $U^{238}F_6$ and condensed $U^{235}F_5$ produced by a preceding laser radiation of the gas jet chemically transforming $U^{235}F_6$ in the jet with the aid of the reaction partner to $U^{235}F_5$, which comprises applying a compression shock to the gas jet which contains the condensed $U^{235}F_5$ by means of a single rigid narrow surface which extends into the edge region of the gas jet and forms an acute angle of 10° to 30° with the direction of the gas jet, said compression shock effecting a deflection of the gaseous $U^{238}F_6$ molecules without essentially deflecting said condensed $U^{235}F_5$, and continuing the condensed $U^{235}F_5$ in the direction of the non-deflected gas jet to a collecting vessel whose opening is bounded at one side by the rigid narrow surface and downstream from the rigid narrow surface at the other side by a peeling-off edge which separates the deflected gas jet from the condensed $U^{235}F_5$.

4,512,958

METHOD OF RECOVERING MOLYBDENUM OXIDE

Günter Bauer, Fürth, and Joachim Eckert, Zirndorf, both of Fed. Rep. of Germany, assignors to GfE Gesellschaft für Elektrometallurgie mbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,510

The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.

Int. Cl.³ C01G *39/02*

U.S. Cl. 423—55 **1 Claim**

1. A method of producing molybdenum oxide which comprises the steps of:

(a) forming an aqueous suspension of a molybdenum sulfide impurity containing concentrate having a mean particle size in the range of 20 microns to 90 microns;

(b) subjecting the suspension produced in step (a) to an elevated oxygen partial pressure and an elevated temperature in an autoclave to oxidize the molybdenum sulfide of said concentrate to molybdenum oxide and produce another suspension, while maintaining the suspension density during oxidation within a range between 100 and 150 g of solids per liter;

(c) controlling the temperature and pressure in said auto-

clave by monitoring the temperature therein and adjusting the suspension density of the suspension fed from step (a) to said autoclave in response to the temperature in said autoclave;

(d) filtering said other suspension to recover molybdenum oxide therefrom and produce a first filtrate containing sulfuric acid;

(e) neutralizing said first filtrate at least partially by adding lime or limestone thereto to produce a third suspension containing calcium sulfate;

(f) filtering said third suspension to recover calcium sulfate and produce a second filtrate;

(g) recirculating said second filtrate to step (a) as the recirculated liquid, step (c) responding to a fall in temperature in said autoclave by increasing the suspension density and to a rise in temperature in said autoclave by adding water in step (a) to the suspension formed therein; and

(h) additionally controlling temperature and pressure in said autoclave at least in part for brief fluctuations in temperature in the autoclave by varying the oxygen partial pressure in said autoclave so as to reduce the temperature by reducing the oxygen partial pressure, the temperature in said autoclave being maintained between substantially 230° and 245° C. and the oxygen partial pressure in said autoclave being maintained between 1 and 5 bar.

4,512,959

METHOD FOR THE RECOVERY OF ALUMINA

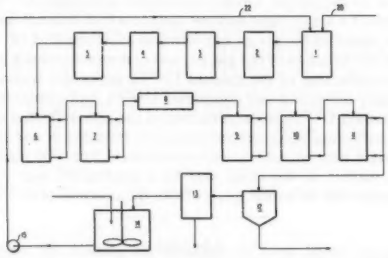
Horst Pohland, Limburgerhof, Fed. Rep. of Germany, and Arthur J. Tielens, Zurich, Switzerland, assignors to Alcoa Chemie GmbH, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,402

Claims priority, application European Pat. Off., Sep. 2, 1982, 82 108086.8

Int. Cl.³ C01F *7/06*

U.S. Cl. 423—121 **25 Claims**



1. Continuous process for the extraction of alumina hydrate from bauxite according to the Bayer process wherein a supersaturated sodium aluminate solution containing dissolved alumina hydrate is formed by wet decomposition of ground bauxite with sodium hydroxide and alumina hydrate is precipitated from the supersaturated sodium aluminate solution in coarse grained form in the presence of seed crystals, comprising:

(a) introducing a suspension of fine seed crystals into the first agglomerator of a cascade of series connected agglomerators, conducting the supersaturated sodium aluminate solution which has been adjusted to have a sodium hydroxide concentration of 200 to 300 g/l, calculated as Na_2CO_3, through the cascade of series connected agglomerators at temperatures from 80° to 65° C. and precipitating part of the dissolved alumina hydrate from the supersaturated sodium aluminate solution to form agglomerates, with the first agglomerator having a solids content of 10 to 50 g/l, calculated as Al_2O_3;

(b) thereafter conducting the sodium aluminate solution containing agglomerates from the last agglomerator through a first cascade of series connected crystallizers, with each crystallizer having an underflow and an overflow which comes from a clarification zone of each crystallizer, and precipitating part of the dissolved alumina hydrate in the first crystallizing cascade in such a manner that at least 80% of the fill volume of each crystallizer has a high solids content and the overflow, which comes from the clarification zone, has a solids content of no more than 20 g/l, with underflow being introduced into the next crystallizer of the first cascade only after being mixed together;

(c) combining the underflow and overflow from the last crystallizer of the first crystallizer cascade to form a combined discharge and cooling the combined discharge to a temperature between 55° C. and 45° C.;

(d) precipitating a part of the dissolved alumina hydrate in the cooled combined discharge in a second cascade of series connected crystallizers, with each crystallizer having an underflow and an overflow which comes from a clarification zone of each crystallizer, in such a manner that at least 80% of the fill volume of each crystallizer of the second cascade has a high solids content and the overflow, which comes from the clarification zone has a solids content of no more than 20 g/l, with underflow and overflow being introduced into the next crystallizer of the second cascade only after being mixed together; and

(e) withdrawing and combining the underflow and overflow of the last crystallizer of the second crystallizer cascade into a crystal suspension of alumina hydrate solids, and fractionating the withdrawn crystal suspension into fine seed crystals and coarse product crystals.

4,512,960

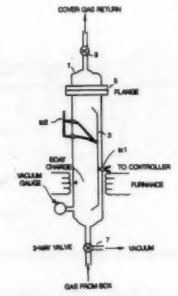
METHOD OF GAS PURIFICATION AND SYSTEM THEREFOR

Raphael Szwarc, Largo, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,621

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—219 **11 Claims**



1. In a method of purifying inert gases by contacting said, gases with a gettering composition to remove water, oxygen and nitrogen, the improvement wherein said contacting is conducted with a composition of one of $Li_x B_{1-x}$, LiAl and LiSi, and wherein $0<x<1$, said LiAl composition is 10-30 weight percent lithium, and said LiSi composition is 34-54 weight percent lithium.

4,512,961
DEALUMINATION OF FAUJASITE-TYPE ZEOLITES USING ION EXCHANGE RESINS

Julius Scherzer, Anaheim, and Adrian P. Humphries, Claremont, both of Calif., assignors to Harshaw/Filtrol, Oakland, Calif.

Filed Aug. 22, 1983, Ser. No. 525,511
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—328 **3 Claims**

1. In the process of producing a dealuminated crystalline alumino-silicate zeolite of the Y-type by hydrothermally treating the zeolite to transfer a portion of its framework aluminum content to a nonframework position, followed by treatment to reduce nonframework aluminum content, carrying out the treatment to reduce nonframework aluminum content by a process comprising the steps of

(a) preparing an aqueous slurry of the hydrothermally treated zeolite,

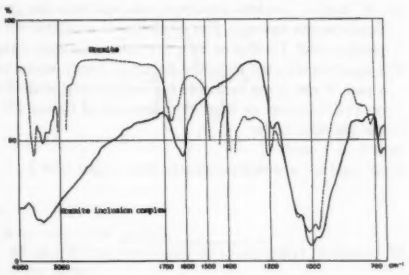
(b) contacting the slurry with a strong acid cation exchange resin of the sulfonated polystyrene type in the hydrogen form in a resin to zeolite weight ratio ranging from 3:1 to 5:1 at a temperature of 100 degrees C. and for a time ranging from 1 to 4 hours, and

(c) recovering zeolite of increased silica to alumina ratio, reduced sodium content and high structural strength.

4,512,962
HORMITE INCLUSION COMPLEX WITH ADSORBED SULPHUR OR SULPHUR DONOR

Kazumi Matsuura, and Takeo Wada, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 13, 1983, Ser. No. 560,791
Claims priority, application Japan, Dec. 27, 1982, 57-230726
Int. Cl.³ C03C *37/07*; C08K *5/36, 9/12*
U.S. Cl. 423—331 **6 Claims**



1. A hormite inclusion complex which comprises hormite having adsorbed and/or supported thereon at least one member selected from the group consisting of sulphur and a sulphur-donating agent.

4,512,963
PALLADIUM COMPOUND SYNTHESIS PROCEDURE

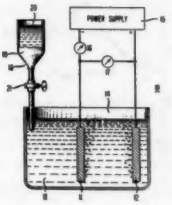
Joseph A. Abys, Bridgewater, and Yutaka Okinaka, Madison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 448,514, Dec. 10, 1982, Pat. No. 4,468,296. This application Jun. 14, 1984, Ser. No. 620,671
Int. Cl.³ C25D *3/52*
U.S. Cl. 423—387 **13 Claims**

1. A process for synthesizing solid form of palladium diammine hydroxide from palladium diammine compound by a procedure comprising the steps of

a. dissolving the palladium diammine compound in aqueous ammonium hydroxide to form a first solution,

b. treating the first solution with an OH-form of anion exchange resin to form a second solution,

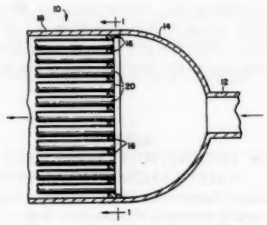


c. freeze-drying the second solution to obtain a solid form of palladium ammine hydroxide.

4,512,964
METHOD FOR FORMING NITRIC OXIDE FROM AMMONIA

Costas G. Vayenas, Wellesley Hills, and Catherine E. Teague, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 315,673, Oct. 27, 1981, abandoned, which is a continuation of Ser. No. 171,679, Jul. 24, 1980, abandoned. This application Mar. 21, 1984, Ser. No. 591,893
Int. Cl.³ C01B *21/26*
U.S. Cl. 423—403 **1 Claim**



1. The process for oxidizing ammonia to form nitric oxide which comprises passing a feed gas containing ammonia and oxygen at an oxygen to ammonia volume ratio larger than 0.5 in contact with a stainless steel catalyst comprising stainless steel-316 containing 23% chromium, 18% nickel, 2% molybdenum, 0.5% carbon, the balance iron at a temperature between about 500° C. and 1000° C. and recovering nitric oxide produced.

4,512,965
HYDROGEN STORAGE MATERIALS OF HYPERSTOICHIOMETRIC ALLOYS

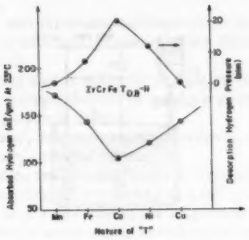
William E. Wallace, and Faiz Pourarian, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 21, 1983, Ser. No. 553,804
Int. Cl.³ C22C *30/00*; C01B *6/00*
U.S. Cl. 423—644 **11 Claims**

1. Alloys of elements in an atomic ratio is expressed by the formula

ZrCrFeTx

wherein T is selected from the group consisting of manganese, iron, cobalt, nickel and copper and wherein x has a value



between 0.1 and 1.0 except when T is iron and then x has a value between 0.1 and 0.6, and their hydrides.

4,512,966

HYDRIDE PRODUCTION AT MODERATE PRESSURE

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 2, 1983, Ser. No. 557,206
Int. Cl.³ C01B *6/26*
U.S. Cl. 423—644 **25 Claims**

1. A two stage process for the production of $NaAlH_4$, said process comprising the steps of:

(a) pressure hydrogenating sodium or sodium hydride with aluminum in a tertiary amine or hydrocarbon reaction medium at about 700–1500 psig at 130°–170° C. in the presence of a catalyst provided by adding an aluminum alkyl, so as to form Na_3AlH_6; and

(b) then reducing the temperature to 80°–120° C. while continuing pressure hydrogenation so as to convert the Na_3AlH_6 to $NaAlH_4$ at a substantially increased reaction rate compared to the reaction rate at the previous temperature.

4,512,967

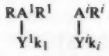
CATIONIC TECHNETIUM COMPLEXES USEFUL AS RADIODIAGNOSTIC AGENTS

Karen E. Linder, Somerville, Mass., assignor to E. I. Du Pont de Nemours and Compamy, Wilmington, Del.

Filed Aug. 2, 1982, Ser. No. 404,372
Int. Cl.³ A61K *43/00, 49/00*
U.S. Cl. 424—1.1 **20 Claims**

1. A cationic lipophilic complex of technetium wherein all of the coordination positions of the technetium atom are filled with a donor atom having a pair of electrons available for forming a coordinate bond with technetium to form said cationic complex, said donor atoms being provided by ligands or salts thereof, said ligands having the following structure:

(A)



wherein:

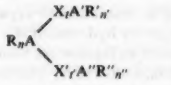
i is an integer from 1 to 6;

R, R^1, R^2, R^3, R^4, R^5 and R^6 are each independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocycloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups, and R plus R^i may be taken together to form a cyclic compound or separately to form a linear compound;

Y^1, Y^2, Y^3, Y^4, Y^5 and Y^6 are independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocycloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

A^1, A^2, A^3, A^4, A^5 and A^6 are each, independently, a donor atom having a free electron pair available for complexing with Tc-99m or Tc-99 to form a cationic complex; and

k_1, k_2, k_3, k_4, k_5 and k_6 are each independently zero or one;

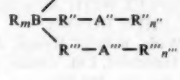


(B)

wherein:

R, R′ and R″ are independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocylcloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

X and X′ are saturated or unsaturated alkyl groups; A, A′ and A″ are independently selected from the group of donor atoms having a pair of electrons available for complexing with Tc-99m or Tc-99 to form a cationic complex; t and t′ are independently 0 or 1; n is 0, 1 or 2; and n′ and n″ are independently the integer 1 or 2; or



wherein

R, R′, R″ and R‴ are independently selected from hydrogen or substituted or unsubstituted alkyl, aryl, alkylaryl, arylalkyl, monocylcloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

A′, A″ and A‴ are independently selected from the group of donor atoms having a pair of electrons available for complexing with Tc-99m or Tc-99 to form a cationic complex;

B is an atom selected from the group of donor atoms having a pair of electrons available for complexing with Tc-99m or Tc-99, boron, or from the elements of Group IV A of the periodic table;

m is 0 or 1; and

n′, n″ and n‴ are independently the integer 1 or 2.

4,512,968

ORAL COMPOSITIONS

Noboru Komiyama, Tokyo; Hiroshi Itoi, Kamagaya, and Hiroshi Sano, Hachioji, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 555,111
Claims priority, application Japan, Nov. 30, 1982, 57-210817; Feb. 18, 1983, 58-24853
Int. Cl.³ A61K *9/68, 7/16, 7/22, 31/715*
U.S. Cl. 424—48 **10 Claims**

1. A composition for reducing dental caries, periodontoclasia and mouth odor, comprising an amount of at least 0.01 wt.% of a material selected from the group consisting of chitin, chitosan, pharmaceutically acceptable acid salts of chitosan and mixtures thereof, effective to reduce the incidence or severity of dental caries, periodontoclasia and mouth odor, said material being compounded in a dentifrice, toothpaste, tooth powder, liquid dentifrice, mouth rinse, oral freshener or chewing gum composition.

4,512,969

COMPOSITIONS CONTAINING HYDROPHOBIC ADDENDA UNIFORMLY LOADED IN LATEX POLYMER PARTICLES

Tsang J. Chen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 327,528, Dec. 4, 1981, abandoned, which is a continuation of Ser. No. 882,282, Feb. 27, 1978, Pat. No. 4,304,769, which is a division of Ser. No. 778,184, Mar. 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 744,842, Nov. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 653,816, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 575,689, May 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 506,919, Sep. 17, 1974, abandoned. This application May 27, 1982, Ser. No. 382,741

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.[3] **A01K** *31/78*

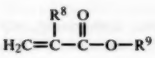
U.S. Cl. 424—81 **10 Claims**

1. A composition containing a continuous aqueous phase and loaded polymer particles having an average diameter of from 0.02 to 0.2 micron and consisting essentially of

(1) a loadable polymer consisting essentially of

(a) repeating units forming from 60 to 95 percent by weight of the polyumer derived from at least one of

(i) acrylate esters having the formula

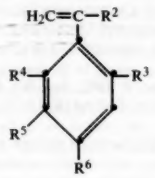


where

R^8 is hydrogen or methyl and

R^9 is lower alkyl having from 1 to 5 carbon atoms;

(ii) styrene-type monomers of the formula



where

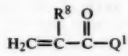
R^2 is hydrogen or methyl,

R^3, R^4 and R^6 are hydrogen or lower alkyl of from 1 to 5 carbon atoms,

R^5 is hydrogen or with R^4 constitutes the atoms necessary to complete a fused benzene ring or one of R^5 and R^6 is halomethyl and

(iii) vinyl acetate;

(b) repeating units forming from 5 to 15 percent by weight of the polymer derived from a hydrophilic ethenic monomer having a molecular weight of at most about 300 of the formula



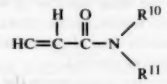
where

R^8 is as defined above,

Q^1 is —OM or a divalent organic radical which together with the carbonyl group of the formula forms an ester or amido linking group terminating in an ammonium or $—SO_3M$ solubilizing group and

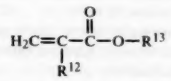
M is hydrogen, ammonium or alkali metal;

(c) repeating uinits forming from 0 to 30 percent by weight of the polymer derived from an acrylamide of the formula

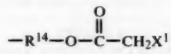


R^{10} and R^{11} are hydrogen or an alkyl or haloalkyl subtituent having from 1 to 5 carbon atoms;

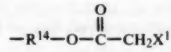
(d) repeating units forming from 0 to 10 percent by weight of the polymer derived from active methylene containing ethenic monomer exhibiting the formula



R^{12} is hydrogen, alkyl having from 1 to 12 carbon atoms or



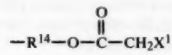
R^{13} is alkyl having from 1 to 10 carbon atoms, cycloalkyl having from 3 to 10 carbon atoms, phenyl or



R^{14} is alkylene having from 1 to 10 carbon atoms and

X^1 is cyano or alkylcarbonyl having from 1 to 8 carbon atoms,

provided that one and only one of R^{12} and R^{13} is always



(e) repeating units forming from 0 to 3 percent by weight of the polymer derived from a crosslinking monomer having a olecular weight of at most about 300 and having at least two independently polymerizable vinyl groups; and

(2) loaded into and distributed through said particles, a hydrophobic pesticide having a solubility in distilled water at 25° C. of less than 0.5 percent and capable of being dissolved in a water-miscible organic solvent, the weight ratio of the hydrophobic pesticide to said loadable polymer being from 1:3 to 1:1.

4,512,970

CHEMORECRUITINS OF LEUKOCYTES AND INFLAMED TISSUES

Josef H. Wissler, Bad Nauheim, Fed. Rep. of Germany, assignor to Max Planck Gesellschaft Zur Forderung der Wissenschaften, Gottingen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 357,880

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110561

Int. Cl.[3] **A61K** *39/395, 37/02;* **C07G** *7/00;* **C12P** *21/00*

U.S. Cl. 424—85 **35 Claims**

1. Leukocyte derived chemorecruitin, characterized by the following properties:

(a) biological activities in vivo and in vitro:

specific induction of selective positive leukocytosis and-/or leftward shift reactions by recruitment of mature

and juvenile leukocytes from the bone marrow into the blood in vivo and in vitro;

positive mobilization of mature and juvenile leukocytes directly from the bone marrow in vitro (also in blood-free systems, for instance cell culture and salt solutions);

they are substantially free of other biological effects;

(b) physico-chemical properties:

no protein quaternary structure in the form of physically bound peptide subunits: each of the native proteins consists of only one peptide unit;

electrophoretic migration in acrylamide matrices at a pH of 7.40 is anodic;

soluble in aqueous media including in 15% ethanol at a pH value of at least 4.0 to 10;

constant temperature coefficient of solubility in ammonium sulfate solutions between −10° C. and +50° C.;

they contain, amongst others, the amino acids tyrosine, phenylalanine, alanine, glycine, lysine, valine, glutamic acid, arginine, leucine;

they adsorb reversibly in structure and biological activity on anion and cation exchangers, calcium phosphate gel and hydroxyapatite and can be subjected in native form to volume partition chromatography.

4,512,971

MITOGENS OF LEUKOCYTES AND INFLAMED TISSUES

Josef H. Wissler, Bad Nauheim, Fed. Rep. of Germany, assignor to Max Planck Gesellschaft Zur Forderung der Wissenschaften, Gottingen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,098

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110611

Int. Cl.[3] **A61K** *39/395, 37/02;* **C07G** *7/00;* **C12P** *21/00*

U.S. Cl. 424—85 **37 Claims**

1. Leukocyte derived mitogens characterized by the following properties:

(a) biological activities in vivo and in vitro:

selective induction of division and differentiation (mitosis) of bone marrow or tissue leukocytes;

they are substantially free of other biological effects.

(b) physico-chemical properties:

electrophoretic migration in acrylamide matrices at a pH of 7.40 is anodic;

soluble in aqueous media including in 10% ethanol at a pH value of 4.0 to 10;

they adsorb reversibly in structure and biological activity on anion and cation exchangers, calcium phosphate gel and hydroxyapatite and can be subjected in native form to volume partition chromatography.

4,512,972

NASAL PREPARATION AND PROCESSES FOR THEIR PRODUCTION

Karl H. Schmidt-Ruppin, Arlesheim, Switzerland, assignor to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 164,642, Jun. 30, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,934

Int. Cl.[3] **A61K** *39/145*

U.S. Cl. 424—89 **8 Claims**

1. A method of preventing infections caused by influenza A and B viruses of the respiratory tract, without inhibiting the formation of hemagglutinative serum antibodies against the virus, and without inhibiting plaque formation, which comprises applying into each nostril, up to seven days prior to infection, a preparation containing a prophylactically effective amount of krestin in a conventional medicinal formulation in order to protect the subject in the antibody-free latency period against infection by the same virus, to bridge the latency period of vaccination against influenza simultaneously with or directly after vaccination, or to ensure protection in the antibody-free latency period without impairment of the antibody formation.

4,512,973

METHOD FOR OVERCOMING TRYPSIN INHIBITION

Mark S. Dennis, San Bruno; David A. Estell, Mountain View, and David R. Light, San Francisco, all of Calif., assignors to Genentech, Inc., San Francisco, Calif.

Filed Oct. 12, 1983, Ser. No. 541,208

Int. Cl.[3] **A61K** *37/48;* **A23L** *1/20*

U.S. Cl. 424—94 **25 Claims**

1. A method for overcoming trypsin inhibition by soybean trypsin inhibitor (STI) in soy based foodstuffs, which method comprises treating the soybean meal used in said foodstuff with a proteolytically effective amount of starfish trypsin 1 (DIT_1) and with a proteolytically effective amount of supplementary proteolytic enzyme.

9. A method of overcoming trypsin inhibition by soybean trypsin inhibitor in a subject animal, which method comprises administering orally to said animal a proteolytically effective amount of, or a composition containing an proteolytically effective amount of, DIT_1 in a dosage form resistant to the digestive conditions of the stomach.

20. A composition suitable for confering the ability to inactivate STI in the intestinal tract of a subject animal, which composition comprises a proteolytically effective amount of DIT_1 in admixture with a pharmaceutically acceptable excipient.

25. A composition comprising soybean meal and a proteolytically effective amount of DIT_1, said soybean meal containing STI which has been substantially inactivated by proteolysis in the presence of the DIT_1.

4,512,974

TREATMENT OF PROTEIN MALNOURISHED SURGICAL PATIENTS

Lyle L. Moldawer, 1 E. Quinobequin Rd., Waban, Mass. 02169; George L. Blackburn, 100 Memorial Dr., Cambridge, Mass. 02142, and Bruce R. Bistrian, 189 Argilla Rd., Ipswich, Mass. 01938

Filed Dec. 8, 1982, Ser. No. 447,984

Int. Cl.[3] **A61K** *35/16*

U.S. Cl. 424—101 **10 Claims**

1. The method of preparing a protein malnourished human for surgery comprising parenterally administering to a protein malnourished human prior to said surgery a sufficient amount of LEM to raise the body temperature of the protein malnourished human above normal during at least some of the time the protein malnourished human is undergoing surgery.

4,512,975

MACBECIN DERIVATIVES AND THEIR PRODUCTION

Toru Hasegawa, Kawanishi; Masayuki Muroi, Suita, and Seiichi Tanida, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 414,031, Sep. 2, 1982, Pat. No. 4,421,687. This application Sep. 14, 1983, Ser. No. 532,051

Claims priority, application Japan, Sep. 26, 1981, 56-152644; Jun. 4, 1982, 57-96711

Int. Cl.[3] **A61K** *35/74;* **C12P** *1/06*

U.S. Cl. 424—121 **1 Claim**

1. Antibiotic C-33196 E-4 or C-33196 E-4-R, which has the following properties:

(a) Antibiotic C-33196E-4:

(I) Melting point: 209°–210° C.

(II) Appearance: Yellow crystals

(III) Specific rotation: $[\alpha]_D^{25}+53°\pm5°$ (c=0.5, $CHCl_3$)

(IV) Elemental analysis (%): C, 63.14±0.5; H, 7.57±0.5; N, 5.26±0.5

(V) Mass spectrum (M^+): m/z 532

(VI) Ultraviolet absorption spectrum: λ_{max}^{MeOH} 276 nm±2

nm ($E_{1\,cm}^{1\%}$ 272±20); λ_{max}^{MeOH} 390 nm±2 nm ($E_{1\,cm}^{1\%}$ 33.5±5)

(VII) Infrared absorption spectrum, principal peaks (cm^{-1}): 1735, 1700, 1670, 1650, 1625, 1605, 1500, 1380, 1305, 1290, 1210, 1050

(VIII) Solubility: Sparingly soluble in petroleum ether, hexane, water; Soluble in chloroform, methylene chloride, toluene, diethyl ether; Readily soluble in acetone, ethyl acetate, methanol, dimethyl sulfoxide

(IX) Color reactions: Positive potassium permanganate test (decoloration); Negative ninhydrin, Ehrlich and Barton reactions

(X) Acidity, neutrality or basicity: Neutral

(XI) Estimated molecular formula: $C_{28}H_{40}N_2O_8$, or

(b) Antibiotic C-33196E-4-R (properties of the crystals containing one molecule of ethyl acetate as the solvent of crystallization):

(I) Melting point: 224°–225° C.

(II) Appearance: Colorless crystals

(III) Specific rotation: $[\alpha]_D^{25}+32°\pm5°$ (c=0,5, MeOH)

(IV) Elemental analysis (%): C, 60.96±0.5; H, 8.25±0.5; N 4.59±0.5

(V) Mass spectrum (M+): m/z 534

(VI) Ultraviolet absorption spectrum: λ_{max}^{MeOH} 307 nm±2 nm ($E_{1\,cm}^{1\%}$ 75±8)

(VII) Infrared absorption spectrum, principal peaks (cm^{-1}): 1720, 1670, 1630, 1600, 1535, 1465, 1380, 1325, 1045

(VIII) Solubility: Sparingly soluble in petroleum ether, hexane, diethyl ether, chloroform and ethyl acetate; Soluble in methanol; Readily soluble in dimethyl sulfoxide

(IX) Color reactions: Positive Barton reaction; Negative ninhydrin and Ehrlich reactions

(X) Acidity, neutrality or basicity: Neutral

(XI) Estimated molecular formula: $C_{28}H_{42}N_2O_8.CH_3COOC_2H_5$.

4,512,976

ANTIBIOTIC STUBOMYCIN AND PROCESS FOR THE PRODUCTION THEREOF

Iwao Umezawa, Tokyo; Kanki Komiyama, and Hideo Takeshima, both of Kanagawa, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,895

Claims priority, application Japan, Oct. 15, 1980, 55-143017

Int. Cl.³ A61K *35/74*; C12P *1/06*

U.S. Cl. 424—122 **2 Claims**

1. Stubomycin having the following physico-chemical properties:

(a) molecular formula: $C_{29}H_{35}NO_5$

elemental analysis:	C%	H%	N%
found:	72.33	7.35	2.83
calculated: (as $C_{29}H_{35}NO_5$)	72.58	7.47	2.80

(b) molecular weight: 477 (by mass spectrometry)

(c) crystal form: colorless plates (from MeOH)

(d) melting point: 243°–245° C. (decomposed)

(e) optical rotation $[\alpha]_D^{20}$: +246° (C=0.5, dimethyl sulfoxide)

(f) ultraviolet absorption spectrum (in MeOH): as shown in FIG. 1

(g) infrared absorption spectrum (KBr): as shown in FIG. 2

(h) solubility:

soluble: dimethyl sulfoxide, dimethylformamide, pyridine

slightly soluble: methanol

insoluble: ethanol, benzene, acetone, chloroform, ethylacetate, water

(i) color reaction:

positive: Rydon-Smith, Dragendorff, ferric chloride, and 2-4-dinitrophenylhydrazine reactions

negative: ninhydrin, Ehrlich, and anisaldehyde H_2SO_4 reactions

(j) nature: acidic substance

or its pharmaceutically acceptable salts.

4,512,977

THERAPEUTIC SELENIUM COMPOSITIONS AND THE USE THEREOF

Joseph R. Lundy, New York, N.Y. (Now by change of name from Joseph R. Levitt), assignor to Lundy Research Laboratories, Inc., New York, N.Y.

Division of Ser. No. 86,391, Oct. 18, 1979, Pat. No. 4,340,590, which is a continuation-in-part of Ser. No. 821,156, Aug. 2, 1977, abandoned. This application Jun. 7, 1982, Ser. No. 386,113

Int. Cl.³ A61K *33/04, 33/38*

U.S. Cl. 424—132 **21 Claims**

1. A therapeutic method for reducing or inhibiting edema in the skin tissue of humans and for accelerating the recovery thereof, said method comprising administering to said human a composition comprising

(i) a water soluble organic or inorganic selenium compound capable of being absorbed by the tissue to be treated to said human said inorganic compound selected from salts wherein the selenium is present in the form of selenate or selenite anions and the cation is pharmaceutically acceptable and said organic compound selected from the group consisting of selenium cystine, selenium methionine and aliphatic mono- and di-selenodicarboxylic acids having about 7 to 11 carbons in the carbon chain, and

(ii) a non-toxic pharmaceutically acceptable carrier or diluent therefor;

said composition being administered so as to provide the equivalent of 0.05 mg–1.0 mg of elemental selenium per day to the host in single or multiple dose form by means selected from oral, topical, parenteral and intravenous infusion.

4,512,978

DERMATOLOGICAL COMPOSITION USEFUL IN THE TREATMENT OF PSORIASIS

Louis R. Inwood, 1684 E. 18th St., Brooklyn, N.Y. 11229

Continuation of Ser. No. 114,910, Jan. 24, 1980, abandoned, and a continuation of Ser. No. 246,108, Mar. 20, 1981, abandoned. This application Oct. 15, 1982, Ser. No. 434,497

Int. Cl.³ A61K *33/30*

U.S. Cl. 424—145 **17 Claims**

1. A dermatological composition comprising 1–20% castor oil, 3–10% crude coal tar, 1–30% starch, 1–20% zinc oxide and 5–40% urea in a hydrophilic ointment base; all percentages expressed by weight of the final composition.

4,512,979

DIPEPTIDES CONTAINING THIALYSINE AND RELATED AMINO ACIDS AS ANTIHYPERTENSIVES

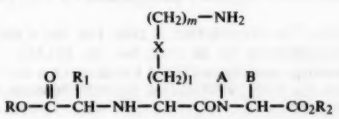
Arthur A. Patchett, Westfield, and Mu T. Wu, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 246,532, Mar. 23, 1981, abandoned. This application Jan. 26, 1982, Ser. No. 341,741

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 514—2 **14 Claims**

1. A compound of the formula:



(I)

wherein:

R and R_2 are independently hydrogen, loweralkyl, aralkyl;

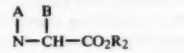
R_1 is alkyl containing one to ten carbon atoms which include

straight chain, branched, unsaturated and cyclic alkyl groups; substituted lower alkyl wherein the alkyl group has 1–6 carbon atoms and the substituent is amino, acylamino, loweralkylthio, arylthio, aryloxy, arylamino, or hydroxy; aralkyl, aralkenyl, heteroaralkyl or heteroaralkenyl wherein the alkyl portion has 1 to 5 carbon atoms such as, for example, phenethyl, cinnamyl or indolylethyl; substituted aralkyl, aralkenyl, heteroaralkyl, or heteroaralkenyl wherein the alkyl or alkenyl group has 1 to 5 carbons optionally substituted by amino, acylamino or hydroxy and wherein the aryl of heteroaryl groups are optionally substituted by halo, dihalo, amino, aminoalkyl, hydroxy, lower alkoxy, aryloxy or lower alkyl;

X is S,

l is 1–2;

m is 2–3;

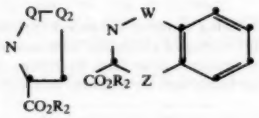


is a grouping wherein:

A is cycloalkyl containing 4–8 carbons in the ring, aryl, aralkyl, heteroaryl, or heteroaralkyl;

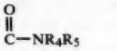
B is hydrogen or loweralkyl; or

A and B can be joined together to form ring structures, including the part-structure N—CH—CO_2R_2, having the formulae:



wherein:

Q_1 and Q_2, taken together, are CH_2CH_2, $CH_2CH_2CH_2$, $COCH_2$, CH_2S, CH_2—CH—OR_3, or CH_2—CH—SR_3 wherein R_3 is hydrogen, loweralkyl, aryl, aralkyl, or



wherein R_4 and R_5 are independently hydrogen, loweralkyl, or aralkyl;

W is a bond, CO, CH_2;

Z is a bond except when W is a bond, CO, CH_2, CH_2CH_2; and, the pharmaceutically acceptable salts thereof.

4,512,980

PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Yoshihiko Kitaura, Sakurai; Osamu Nakaguchi, Toyonaka; Keiji Hemmi, Suita; Matsuhiko Aratani, Suita; Hidekazu Takeno, Tenri; Satoshi Okada, Takatsuki; Hirokazu Tanaka, Takarazuka, and Masashi Hashimoto, Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co. Ltd., Osaka, Japan

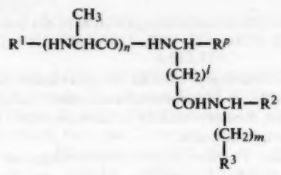
Division of Ser. No. 193,453, Oct. 3, 1980, Pat. No. 4,354,966. This application Jul. 28, 1982, Ser. No. 402,438

Claims priority, application United Kingdom, Oct. 11, 1979, 7935401; Oct. 15, 1979, 7935730; Oct. 17, 1979, 7936000; Mar. 28, 1980, 8010459

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/02*

U.S. Cl. 514—18 **5 Claims**

1. A compound of the formula or its pharmaceutically acceptable salt:

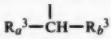


wherein

R^1 is hydrogen or acyl;

R^2 is carboxy or protected carboxy or a group of the formula: —COHN—R_a^2 wherein R_a^2 is carboxy (lower) alkyl or protected carboxy (lower) alkyl;

R^3 is carboxy, protected carboxy, lower alkyl, hydroxyphenyl, carbamoyl or a group of the formula:



wherein R_a^3 is hydrogen, amino, protected amino or acylamino, R_b^3 is carboxy or protected carboxy;

R^p is carboxy, protected carboxy, carbamoyl, carboxy (lower) alkyl or protected carboxy (lower) alkyl;

l is an integer 0;

m is an integer 3; and

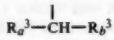
n is an integer 1, provided that

when R^1 is hydrogen or acyl,

R^2 is carboxy, protected carboxy or a group of the formula: —CONHR_a^2 wherein R_a^2 is carboxy (lower) alkyl or protected carboxy (lower) alkyl,

R^p is carboxy, or protected carboxy,

R^3 is carbamoyl, lower alkyl or hydroxyphenyl or a group of the formula:



wherein R_a^3 is hydrogen or acylamino and R_b^3 is carboxy or protected carboxy, and

when R^p is carbamoyl, then

R^1 is acyl.

4,512,981

METHOD OF TREATING INFLAMMATION USING INOSIPLEX

Paul Gordon, Chicago, Ill., assignor to Newport Pharmaceuticals International, Inc., Newport Beach, Calif.

Filed Dec. 20, 1982, Ser. No. 451,054

Int. Cl.[3] **A61K** *31/70*

U.S. Cl. 514—45 **10 Claims**

1. A method of treating an inflammatory disease having a non-specific component comprising administering to a mammal afflicted with such disease an amount of inosiplex effective to reduce the inflammation, the inosiplex being administered in the absence of indomethacin or aspirin.

4,512,982

9α-AZA-9α-HOMOERYTHROMYCIN COMPOUNDS, PHARMACEUTICAL COMPOSITION AND THERAPEUTIC METHOD

James R. Hauske, East Lyme, and Arthur A. Nagel, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

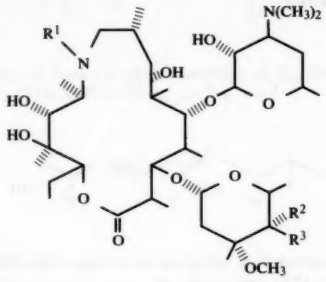
Filed Apr. 13, 1984, Ser. No. 600,252

Int. Cl.[3] **A61K** *31/70;* **C07H** *17/08*

U.S. Cl. 514—29 **12 Claims**

5. A method of treating a bacterial infection in a mammalian

subject, which comprises administering thereto an antibacterially effective amount of a macrolide antibiotic compound of the formula



or a pharmaceutically-acceptable acid-addition salt thereof; wherein

R^1 is selected from the group consisting of hydrogen and methyl; and

R^2 and R^3 are each selected from the group consisting of hydrogen and amino;

provided that R^2 and R^3 are always different.

4,512,983

METHOD FOR MAKING A SANITARY DRINK

Kunihiko Shino, Sakae-cho 17, Nerima-ku, Tokyo, 176, and Tamiji Matoba, 59, Tomei-cho 5-chome, Chikusa-ku, Nagoya-shi, 464, both of Japan

Filed Sep. 29, 1982, Ser. No. 426,458

Int. Cl.[3] **A61K** *35/78, 31/70;* **A23F** *3/00*

U.S. Cl. 424—195.1 **14 Claims**

1. A method for the preparation of a beverage, which comprises:

mixing (1) basidiomycetes fungus of the family Polyporaceae and containing polysaccharides and organic germanium substances, with (2) hydrangea tea, to prepare a starting mixture thereof;

adding water to said starting mixture in an amount of from 5 to 20 times the weight of said starting mixture to obtain an aqueous mixture;

heating said aqueous mixture at a temperature in the range of 50° C. to 150° C. for a time period sufficient to extract, into the aqueous phase, water-soluble substances comprising polysaccharides and organic germanium compounds from said fungus and said tea;

removing solids from said aqueous mixture to thereby obtain an aqueous extract;

adding an organic acid which is physiologically harmless to human beings to said extract in an amount sufficient to reduce the pH of said extract to below 7;

allowing said extract to stand at a temperature higher than the freezing point thereof but lower than the temperature at which said extract begins to decay for a period sufficient to allow insoluble matter to precipitate from said extract;

removing said precipitated insoluble matter from said extract; and

heating said extract to thermally sterilize said extract, thereby forming said beverage.

4,512,984

DIFLUOROMETHOXYPHENYL THIOPHOSPHATES AS PESTICIDES

Walter Seufert, Speyer; Juergen Varwig, Heidelberg; Gerd Husslein, Ludwigshafen; Wolfgang Seppelt, Bobenheim-Roxheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

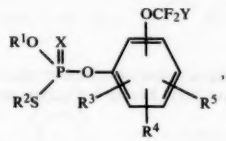
Filed May 27, 1983, Ser. No. 498,761

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220113

Int. Cl.[3] **A01N** *57/14;* **C07F** *9/165*

U.S. Cl. 514—147 **7 Claims**

1. A difluoromethoxyphenyl thiophosphate of the formula



1

where R^1 is alkyl of not more than 3 carbon atoms, R^2 is unsubstituted alkyl of not more than 5 carbon atoms or said alkyl substituted by methoxy, ethoxy, isopropoxy, ethylthio or chlorine, Y is hydrogen or chlorine, X is oxygen or sulfur and R^3, R^4 and R^5 are each hydrogen or halogen.

2. A method of protecting crops from insects and other arthropods which comprises: applying to said crops a composition containing a carrier and an effective amount of a compound as defined in claim 1.

4,512,985

N-CARBAMOYL DERIVATIVES OF (5,4B)-ISOTHIAZOLO PYRIDINE-3-ONE AND ANTI-ACNE COSMETIC COMPOSITIONS CONTAINING THE SAME

Jean Maignan, Tremblay-les-Gonesse, and Braham Shroot, Antibes, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

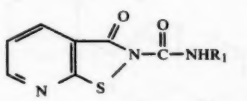
Filed Apr. 13, 1983, Ser. No. 484,619

Claims priority, application Luxembourg, Apr. 16, 1982, 84091

Int. Cl.[3] **A61K** *31/425*

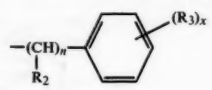
U.S. Cl. 514—301 **9 Claims**

1. N-carbamoyl derivative of (5,4b)-isothiazolo pyridine-3-one having the formula



wherein

R_1 represents hydrogen, linear or branched alkyl having 1–12 carbon atoms, cycloalkyl having 3–6 carbon atoms or

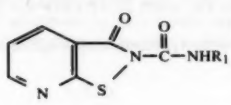


wherein n is 0 or 1, x is 1, 2 or 3, R_2 represents hydrogen or lower alkyl having 1–3 carbon atoms and R_3 represents hydrogen, lower alkyl having 1–3 carbon atoms, nitro, trifluoromethyl or halogen,

the salts thereof with a mineral or organic acid and

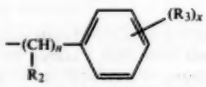
the optical isomers thereof when R_2 represents alkyl and n equals 1.

9. A method for the treatment of acne so as to inhibit the activity of *Corinebacterium acnes* and *Propionibacterium granulosum*, said method comprising applying an amount of an anti-acne cosmetic composition effective to inhibit said *Corinebacterium acnes* and *Propionibacterium granulosum* to the area of the skin affected by acne, said anti-acne composition comprising in an aqueous, alcoholic or hydroalcoholic carrier from 0.1 to 10 weight percent, based on the total weight of said composition, of a N-carbamoyl derivative of (5,4b)-isothiazolo pyridine-3-one having the formula



wherein

R_1 represents hydrogen, linear or branched alkyl having 1–12 carbon atoms, cycloalkyl having 3–6 carbon atoms or



wherein n is 0 or 1, x is 1, 2 or 3, R_2 represents hydrogen or lower alkyl having 1–3 carbon atoms, R_3 represents hydrogen, lower alkyl having 1–3 carbon atoms, nitro, trifluoromethyl or halogen, the salts thereof with a mineral or organic acid and the optical isomers thereof when R_2 represents alkyl and n equals 1.

4,512,986

PROGRESTATIONALLY ACTIVE STEROIDS

Jerry R. Reel, Cary, and Clarence E. Cook, Chapel Hill, both of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

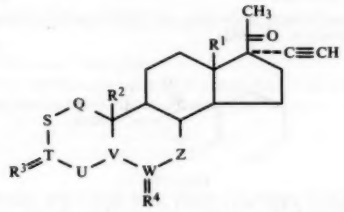
Filed Jul. 26, 1983, Ser. No. 517,457

Int. Cl.³ C07J 5/00

U.S. Cl. 514—170 **41 Claims**

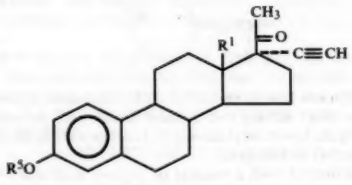
2. A steroid selected from the group consisting of

(a) a steroid having the formula



and

(b) a steroid having the formula

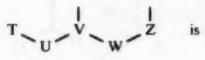


wherein

R^1 is selected from the group consisting of methyl, ethyl, and propyl;

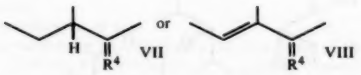
R^2 is selected from the group consisting of H and methyl;

R^3 is selected from the group consisting of OXO and H(OR⁵);



is

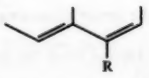
(a)



wherein

R^4 is selected from the group consisting of H_2, H(methyl), H(Cl), H(F), and $=CH_2$; or

(b)



wherein;

R is selected from the group consisting of H, methyl, Cl, and F;

R^5 is H or a pharmaceutically acceptable substituent selected from the group consisting of:

acyl having from 1 to 12 carbon atoms,

2-tetrahydropyranyl, 4-tetrahydropyranyl,

1-cycloalkyl having from 5 to 7 carbon atoms,

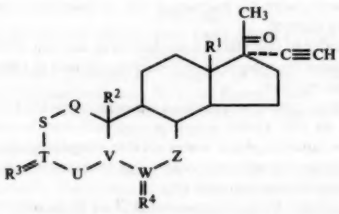
1-methoxycycloalkyl and 1-ethoxycycloalkyl in which the cycloalkyl group has from 5 to 7 carbon atoms,

cycloalkylcarbonyl wherein the cycloalkyl group has from 5 to 10 carbon atoms,

benzoyl, phenacetyl, 1-adamantylcarbonyl, and 1-cyclopentylcarbonyl; and

Q-S is CH=CH— or $—CH_2—CH_2—$.

14. A method of inducing a progestational response in a mammal, comprising administering to said mammal an effective amount of a compound exhibiting progestational activity, said compound having the formula



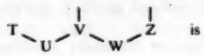
V

wherein

R^1 is selected from the group consisting of methyl, ethyl, and propyl;

R^2 is selected from the group consisting of H and methyl;

R^3 is selected from the group consisting of OXO and H(OR⁵);



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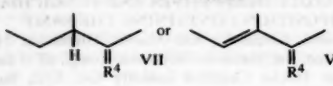
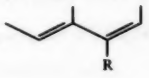


wherein

R^4 is selected from the group consisting of H_2, H(methyl), H(Cl), H(F), and $=CH_2$; or



wherein

R is selected from the group consisting of H, methyl, Cl, and F; and

Q-S is selected from the group consisting of —CH=CH— and $—CH_2—CH_2—$.

4,512,987

NEW PHARMACEUTICAL PREPARATIONS

Ciibor Schindlery, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1982, Ser. No. 434,094

Claims priority, application United Kingdom, Jul. 15, 1982, 8220561

Int. Cl.³ A61K *31/56*

U.S. Cl. 514—171 **10 Claims**

1. A pharmaceutical preparation for topical administration which contains the corticoid, 2-chloro-6α,9α-difluoro-16α-methyl 11β, 17α, 21-trihydroxy-pregna-1,4-diene-3,20-dione, and the antimicrobial agent, 2,4,4'-trichloro-2'-hydroxy-diphenyl ether, said preparation containing in the range of from about 0.01% to about 2.5% of said corticoid and from about 0.1% to about 5% of said antimicrobial agent.

8. A method of treatment of infected or infection prone: acute contact dermatitus, acute endogenous eczema, acute nummular eczema, acute seborrhoeic eczema, impetigo contagiosa, ostiofolliculitis, inflamed folliculitis barbae, ecthyma, intertrigo, erythrasma or acute inflamed superficial dermatomycoses, comprising administering an effective amount of a pharmaceutical composition according to claim 1 to a patient in need of the same.

4,512,988

ACYLAMINO OXO OR HYDROXY SUBSTITUTED ALKYLAMINO THIAZINES AND THIAZEPINES

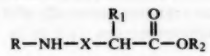
Harold N. Weller, III; Eric M. Gordon, both of Pennington; Donald S. Karanewsky, East Windsor, and Denis E. Ryono, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 1, 1984, Ser. No. 585,058

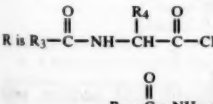
Int. Cl.³ C07D *279/06, 285/36;* **A61K** *31/55, 31/54*

U.S. Cl. 514—211 **11 Claims**

1. A compound of the formula



and a pharmaceutically acceptable salt thereof wherein



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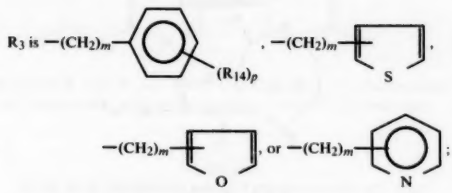
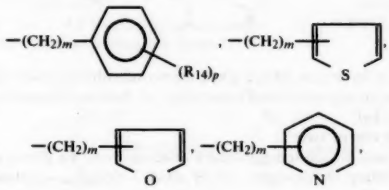
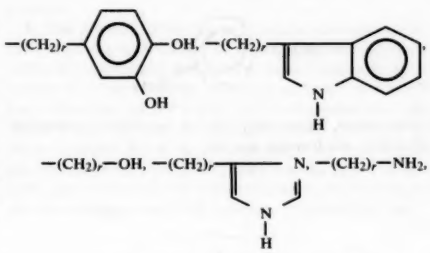


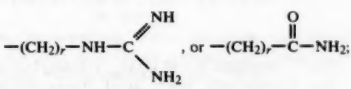
R_4 is hydrogen, lower alkyl,



halo substituted lower alkyl, $—(CH_2)_m—$cycloalkyl,



$—(CH_2)_r—SH$, $—(CH_2)_r—S—$lower alkyl,

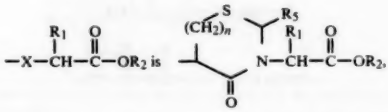


R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

r is one, two, three or four;



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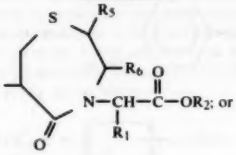
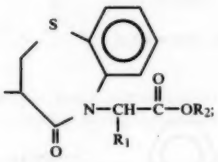
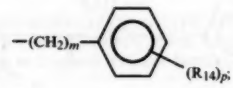




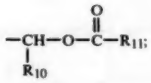
R_1 is hydrogen, lower alkyl, amino substituted lower alkyl, hydroxy substituted lower alkyl, or halo substituted lower alkyl;

n is one or two;

R_5 and R_6 are independently selected from the group consisting of hydrogen, lower alkyl, $-(CH_2)_m-$cycloalkyl and



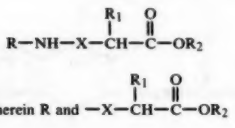
R_2 is hydrogen, lower alkyl, benzyl, benzhydryl, trimethylsilylethyl, salt forming ion, or



R_{10} is hydrogen, lower alkyl, cycloalkyl or phenyl; and

R_{11} is hydrogen, lower alkyl, lower alkoxy, cycloalkyl, phenyl, benzyl, or phenethyl.

10. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of a hypotensive agent or pharmaceutically acceptable salt thereof of the formula



are as defined in claim **1**.

4,512,989

1,2,4-TRIAZOLE DERIVATIVES AND FUNGICIDAL COMPOSITION CONTAINING THE SAME

Hiroshi Ohyama, Chigasaki; Ken Morita, Hiratsuka; Takuo Wada, Hatano, and Masahiko Miyahara, Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,623

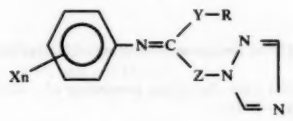
Claims priority, application Japan, Oct. 15, 1981, 56-163409

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.[3] **A01N** *43/64, 55/02;* **C07D** *249/08;* **C07F** *1/08*

U.S. Cl. 514—383 **12 Claims**

1. A 1,2,4-triazole derivative of the general formula



[I]

wherein X may be the same or different and denotes a halogen atom, a (C_1-C_4)alkyl group, a (C_1-C_4)alkoxyl group, a (C_1-C_4)alkylthio group, a (C_1-C_4)alkylsulfinyl group, a (C_1-C_4)alkylsulfonyl group, a trifluoromethyl group, a nitro group or a cyano group;

n is an integer of 0 to 5;

R denotes a (C_1-C_4)alkyl group, a (C_2-C_4)alkenyl group, a (C_2-C_4)alkynyl group, a (C_1-C_4)alkoxy-(C_1-C_4)alkyl group, a (C_1-C_4)alkylthio-(C_1-C_4)alkyl group, a (C_3-C_6)cycloalkyl group, a (C_3-C_6)cycloalkyl-(C_1-C_4)alkyl group, a phenyl group, a mono-halophenyl group, a di-halophenyl group, a tri-halophenyl group, or a phenyl-(C_1-C_4)alkyl group of which the phenyl may optionally bear up to three substituents selected from a halogen atom, a (C_1-C_4)alkyl group, a (C_1-C_4)alkoxyl group, a (C_1-C_4)alkylthio group, a (C_1-C_4)alkylsulfonyl group, trifluoromethyl group, cyano group and nitro group, these substituents being the same or different from each other;

Y denotes an oxygen atom or a sulfur atom; and

Z denotes a linear or branched (C_1-C_6)alkylene group, and a salt of said 1,2,4-triazole derivative.

11. A fungicidal composition comprising as the active ingredient a fungicidally effective amount of a 1,2,4-triazole derivative as defined in claim **1**, or a salt thereof, in association with an acceptable carrier for the active ingredient.

4,512,990

BENZTHIAZINE ANALOGS AS ANTIINFLAMMATORY AGENTS

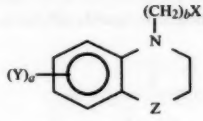
Peter H. Nelson, Los Altos; Howard J. Ringold, Woodside; Stefan H. Unger, and Thomas R. Thieme, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.), Inc., Palo Alto, Calif.

Filed Feb. 18, 1982, Ser. No. 349,738

Int. Cl.[3] **C07D** *279/16;* **A61K** *31/54*

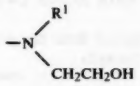
U.S. Cl. 514—225 **1 Claim**

1. A method for inhibiting, preventing, or reducing inflammation which method comprises administering to a subject in need of such treatment a therapeutically effective amount of a compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

Z is S;
Y is halo, alkoxy, alkyl, or dialkylamino;
a is 0, 1 or 2;
b is an integer from 2–12 with the proviso that if b is 2 or 3, a cannot be 0, and with the further proviso that if X is OH or NH_2, b cannot be 2–5; and
X is selected from the group consisting of: —OH, OR^1, —NH_2, —NHR^1, NR_2^1,



and —NHCONHR^2 in which
each R^1 is independently alkyl or cycloalkyl or, in —NR_2^1, both R^1s together are alkylene or form a piperazine ring optionally substituted at the ring N by alkyl or —CH_2CH_2OH; and
R^2 is alkyl, cycloalkyl, or phenyl optionally substituted with 1–3 substituents selected from the group consisting of halo, lower alkyl of 1–4 carbon atoms, lower alkoxy of 1–4 carbon atoms, hydroxy, and trifluoromethyl.

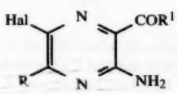
4,512,991

3-ACYL-2-AMINO-5-HALO-6-(SUBSTITUTED)PYRAZINE ANTIMICROBIAL COMPOUNDS

David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1982, Ser. No. 453,054
Int. Cl.^{3} A01N *43/60, 43/10;* **C07D** *241/16, 417/02*
U.S. Cl. 514—252 **14 Claims**

1. A compound of the formula:



(I.)

wherein:
Hal is bromine or chlorine; and
R is chloro, but only when R^1 is other than hydrogen; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substitvents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; phenylthio:
R^1 is hydrogen; straight or branched C_{1-8} alkyl; phenyl; pyrrole; thiophene; wherein each of said phenyl, pyrrole, and thiophene groups may be substituted with up to two members selected from the group consisting of C_{1-3} alkyl, C_{1-3} alkoxy, halo, and mono- or di-C_{1-3} alkyl substituted amino; pyridin-2-yl; thiazol-2-yl; and C_{2-4} alkenyl.

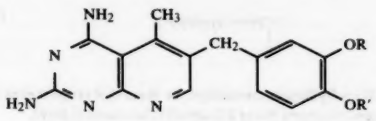
4,512,992

TREATMENT WITH DIALKOXY PYRIDOPYRIMIDINE COMPOUNDS

David S. Duch, Gary; Charles A. Nichol, Durham, and Carl W. Sigel, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., N.C.

Continuation of Ser. No. 159,241, Jun. 13, 1980, abandoned. This application Feb. 6, 1981, Ser. No. 231,977
The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.
Int. Cl.^{3} A61K *31/505*
U.S. Cl. 514—258 **8 Claims**

1. A method of treating psoriasis in a mammal suffering from psoriasis comprising the administration of a non-toxic, effective antipsoriasis amount of a compound of formula (II):



(II)

wherein R and R′ are lower (C_1–C_6) alkyl, or pharmaceutically acceptable acid addition salt thereof to said mammal.

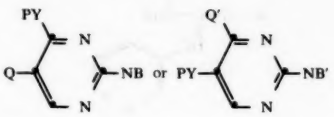
4,512,993

4(OR 5)-(PYRIDINYL)-2-PYRIMIDINAMINES AND CARDIOTONIC USE THEREOF

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jul. 25, 1983, Ser. No. 516,820
Int. Cl.^{3} A61K *31/505;* **C07D** *239/24*
U.S. Cl. 514—275 **8 Claims**

1. A 4-PY-5-Q-2-pyrimidinamine or 5-PY-4-Q′-2-pyrimidinamine having the formula



or acid-addition salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, Q and Q′ are each hydrogen or methyl, NB is dimethylamino or N-(2-hydroxyethyl)methylamino and NB′ is amino or dimethylamino.

8. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically effective amount of 4-PY-5-Q-2-pyrimidinamine or 5-PY-4-Q′-2-pyrimidinamine according to claim 1 or pharmaceutically acceptable acid-addition salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, Q and Q′ are each hydrogen or methyl, NB is dimethylamino or N-(2-hydroxyethyl)methylamino and NB′ is amino or dimethylamino.

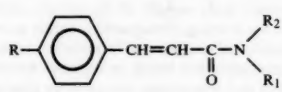
4,512,994

LONG-ACTING THEOPHYLLINE IN MEDICINAL FORM

Michel Bayssat, Charbonnieres; Maryse Belleville, and Marcel Grand, both of Lyons, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

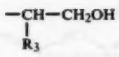
Filed May 3, 1983, Ser. No. 491,025
Claims priority, application France, May 4, 1982, 82 07695; Apr. 14, 1983, 83 06075
Int. Cl.^{3} A61K *31/52*
U.S. Cl. 514—374 **13 Claims**

1. A long-acting theophylline base medicinal composition, comprising a mixture of theophylline with an amount sufficient to increase the theophylline half-life in the blood of a cinnamamide compound of the formula



(I)

wherein R is hydrogen, halogen or acetyl; R_1 is hydrogen or methyl; R_2 is



(II)

wherein R_3 is hydrogen or methyl; or R_1 and R_2 together with the adjacent nitrogen form 2,2-dimethyl-3-oxazolidinyl.

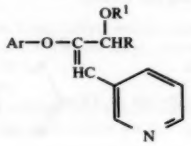
4,512,995

PHENOXYALKENYLPYRIDINE DERIVATIVES AND FUNGICIDAL METHODS OF USE

Allan F. Rose, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 3, 1983, Ser. No. 455,190
Int. Cl.³ C07D *213/30;* A01N *43/40*
U.S. Cl. 514—277 **19 Claims**

1. A compound having the formula



(I)

wherein

Ar is phenyl; substituted phenyl having one or two substituents independently selected from the group of halo, lower alkyl, or lower alkoxy;

R is phenyl or the group $—C(CH_3)_2)CH_2)R^2$ wherein R^2 is hydrogen lower alkyl having 1 through 4 carbon atoms, hydroxy, or halo; and

R^1 is lower alkyl, benzyl, allyl, or haloallyl having one or two halo substituents independently selected from the group of fluoro, chloro, bromo or iodo;

and non-phytotoxic salts thereof.

16. A method for controlling fungi which comprises applying a fungicidally effective amount of the compound of claim **1**, to said fungi or to their habitat.

4,512,996

BENZOYLECGONINE OR BENZOYLNORECGONINE AS ACTIVE AGENTS FOR THE TREATMENT OF RHEUMATOID ARTHRITIS

Lowell Somers, 16630 Mountain View Rd., Desert Hot Springs, Calif. 92240

Division of Ser. No. 448,928, Dec. 13, 1982, Pat. No. 4,469,700, which is a continuation of Ser. No. 275,307, Jun. 19, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 584,830
Int. Cl.³ A61K *31/46*
U.S. Cl. 514—304 **6 Claims**

1. A pharmaceutical formulation for the treatment of rheumatoid arthritis comprising one or more active agents selected from benzoylecgonine and benzoylnorecgonine in amounts of approximately 0.187 mg to about approximately 5.0 mg per dose, per kilogram body weight of the patient, said amounts being effective for treating rheumatoid arthritis in association with a pharmaceutical carrier, the formulation being adapted for oral administration and being an aqueous solution of the active ingredient and comprising one or more pharmaceutical carriers selected from a group consisting of mannitol, lactose, starch, magnesium stearate, talcum, cellulose, glucose, sucrose, gelatin, sorbitol and magnesium carbonate.

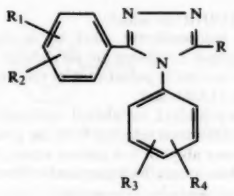
4,512,997

4,5-BIS(ARYL)-4H-1,2,4-TRIAZOLE DERIVATIVES AND ANALGESIC USE

Jean Meier, La Varenne Saint Hilaire, and Francois Clemence, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Continuation of Ser. No. 292,790, Aug. 14, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,747
Claims priority, application France, Aug. 22, 1980, 80 18354
Int. Cl.³ A61K *31/395;* C07D *249/08*
U.S. Cl. 514—383 **28 Claims**

1. A compound selected from the group consisting of 4H-1,2,4-triazoles of the formula



I

wherein R_1, R_3 and R_4 may be in different positions of the benzene rings and are individually selected from the group consisting of hydrogen, —OH, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, $—CF_3$, $—NO_2$, $—NH_2$ and —NH—AlK and

and AlK, AlK_1 and AlK_2 are alkyl of 1 to 4 carbon atoms or R_1 and R_2 together and/or R_3 and R_4 together are methylenedioxy, R_2 is alkoxy of 1 to 4 carbon atoms, R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, $—CH_2—COOH$ and $—CH_2—COOAlK_3$ and AlK_3 is alkyl of 1 to 4 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

11. An analgesic composition comprising an analgesically effective amount of at least one compound of claim **1** and an excipient.

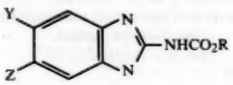
4,512,998

ANTHELMINTIC BENZIMIDAZOLE CARBAMATES

M.Mehdi Nafissi-Varchei, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

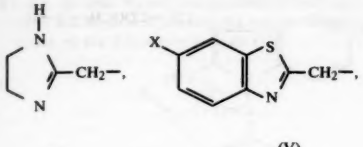
Filed Oct. 20, 1980, Ser. No. 198,423
Int. Cl.³ A61K *31/425, 31/415;* C07D *417/02, 513/04*
U.S. Cl. 514—367 **8 Claims**

1. A compound of the formula

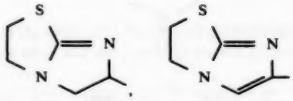


(I)

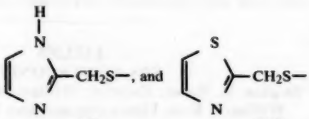
wherein R is alkyl having 1 to 4 carbon atoms; one of Y and Z is a heterocyclic moiety selected from groups of the formula



(II) (V)



(IX) (X)



(XI) (XII)

wherein X is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or hydrogen, and the other of Y and Z is hydrogen, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms.

5. A method of treating helminth infestation in mammals which comprises administering to an infected mammal an effective amount of a compound as claimed in any one of claims 2, 1 3 or 4.

4,512,999

METHOD OF INHIBITING β-LACTAMASE FORMING PATHOGENS

Solange Adam-Molina, St. Louis, France, and Werner Hofheinz, Bottmingen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

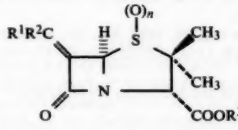
Filed Oct. 20, 1981, Ser. No. 312,956

Claims priority, application Switzerland, Oct. 24, 1980, 7946/80

Int. Cl.³ C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **12 Claims**

1. A method of inhibiting beta-lactamase forming pathogens in an individual in need of such treatment which comprises treating said individual with an effective amount of a compound of the formula



I

wherein R^1 is cyano or a group of the formula R^4—CO— or R^5—A—CO, R^3 is hydrogen, lower alkyl or halogen, R^3 is hydrogen or a group selected from alkanoyloxyalkyl, alkoxycarbonyloxyalkyl, lactonyl, alkoxymethyl and alkanoylaminomethyl, n is the number 0, 1 or 2, R^4 is hydrogen, hydroxy, lower alkoxy, lower alkyl, phenyl or phenyl substituted by halogen, nitro, hydroxy, lower alkyl or lower alkoxy or a group of the formula

R^5 is halogen, lower alkoxy, lower alkylthio, lower alkylsulphinyl, lower alkylsulphonyl, di-(lower alkoxy)-phosphinyl, phenyl or phenyl substituted by halogen, nitro, hydroxy, lower alkyl or lower alkoxy, phenyloxy, phenylthio, phenylsulphinyl, phenylsulphonyl or phenyloxy, phenylthio, phenylsulphinyl and phenylsulphonyl substituted by halogen, nitro, hydroxy, lower alkyl or lower alkoxy, R^6 and R^7 are lower alkyl and A is lower alkylene, and pharmaceutically acceptable salts of carboxylic acids of formula I with bases.

4,513,000

INSECTICIDAL N-SUBSTITUTED O-PYRAZOL-4-YL CARBAMATES AND USE THEREOF

Fritz Maurer, Wuppertal; Bernhard Homeyer, Leverkusen, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

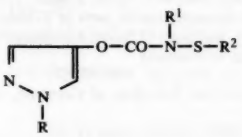
Filed Oct. 8, 1982, Ser. No. 433,337

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142857

Int. Cl.³ A01N *43/56;* **C07D** *231/14, 403/12*

U.S. Cl. 514—407 **7 Claims**

1. A compound of the formula

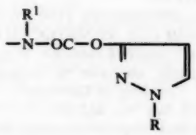


in which

R is a straight-chain or branched alkyl radical which has 1 to 6 carbon atoms;

R^1 is a straight-chain or branched alkyl radical having 2 to 6 carbon atoms;

R^2 is an alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by up to 3 halogen atoms; or represents the radical



7. A method of combating insects which comprises applying to the insects or to a habitat thereof an insecticidally effective amount of a compound according to claim 1.

4,513,001

β-ADRENERGIC 1-[1-BENZIMIDAZOLYL]-N-[2-(4-HYDROXY-3-METHOXY-PHENYL)-2-HYDROXY-ETHYL]-3-AMINO BUTANE AND SALTS AND HYDRATES THEREOF

Michel Joannic, Neuilly-sur-Marne; Francoise Roquet, and Marcel Pesson, both of Paris, all of France, assignors to Laboratoire Roger Bellon, Neuilly sur Seine, France

Filed Mar. 22, 1983, Ser. No. 477,680

Claims priority, application France, Mar. 24, 1982, 82 05035

Int. Cl.³ A61K *31/415*; C07D *235/06*

U.S. Cl. 514—394 **8 Claims**

8. Method of treating asthma or premature labor, comprising administering to the patient a physiologically effective amount of beta-adrenergic 1-(1-benzimidazolyl-N-(2-(4-hydroxy-3-methoxy-phenyl)-2-hydroxy-ethyl)-3-amino butane or a non-toxic acid addition salt thereof or a hydrate of said salt.

4,513,002

CYCLOHEPTENE DERIVATIVES

Werner Aschwanden, Ettingen; Quirico Branca, Basel; Emilio Kyburz, Reinach, and Rudolf Pfister, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 14, 1981, Ser. No. 330,733

Claims priority, application Switzerland, Jan. 16, 1981, 273/81

Int. Cl.³ A61K *31/40*

U.S. Cl. 514—408 **2 Claims**

1. A method of controlling or preventing allergic reactions which comprises administering to a host requiring such treatment an effective amount of 1-[2-(4,5,10,11-tetrahydro-1H-dibenzo[a,d]cyclohepten-5-yl)ethyl]pyrrolidine or a pharmaceutically acceptable acid addition salt thereof.

4,513,003

PROCESS FOR PROTECTING WOOD USING N-(DICHLOROFLUOROMETHYLTHIO)-3,6-ENDOMETHYLENE-Δ⁴-TETRAHYDROPHTHALIMIDE

Engelbert Kühle, Bergisch-Gladbach; Erich Klauke, Odenthal; Wilfried Paulus, and Hermann Genth, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,632

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131250

Int. Cl.³ C07D *209/48*; A61K *31/40*

U.S. Cl. 514—411 **2 Claims**

1. A process for protecting wood against microbial alteration or damage by a microorganism which comprises applying to said wood a microbicidally effective amount of N-(dichlorofluoromethylthio)-3,6-endomethylene-Δ⁴-tetrahydrophthalimide.

4,513,004

INDOLE DERIVATIVES, PROCESSES FOR THEIR PREPARATION, AND THEIR USE AS MEDICAMENTS

Karl-Heinz Boltze, Borod, and Harald Horstmann, Wuppertal, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG, Cologne, Fed. Rep. of Germany

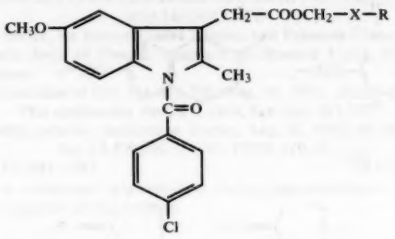
Filed Feb. 3, 1983, Ser. No. 463,370

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206885

Int. Cl.³ C07D *405/12*; A61K *31/405*

U.S. Cl. 514—414 **6 Claims**

1. An indole compound of the formula (I)



in which

X represents —COO— or —CONH— and

R represents a tetrahydrofuran-2-yl- or a tetrahydropyran-2-yl- group,

and their pharmaceutically acceptable salts.

4,513,005

SRS-A ANTAGONISTS

Stephen R. Baker, Eversley; William B. Jamieson, Woking; William J. Ross, Lightwater, and Alec Todd, Wokingham, all of England, assignors to Lilly Industries Limited, London, England

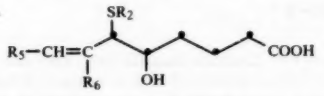
Filed Jun. 9, 1982, Ser. No. 386,570

Claims priority, application United Kingdom, Jun. 18, 1981, 8118720; May 7, 1982, 8213211

Int. Cl.³ C07C *149/20*; A61K *31/335, 31/23*

U.S. Cl. 514—451 **9 Claims**

1. A compound of the formula



in which R_2 is alkyl, cycloalkyl or alkenyl of up to 10 carbon atoms, unsubstituted or substituted by one or more substituents selected from aryl, cycloalkyl, halogen, hydroxy, NHR_3, and COX, where R_3 is H, C_{1-4} alkyl, aryl, or COX', X is OH, OR', or NH_2, X' is C_{1-4} alkyl or NH_2, and R' is C_{1-4} alkyl, R_5 is C_{10-14} alkyl or $R_7CH{=}CH{-}$, where R^7 is C_{8-12} alkyl, phenyl, or naphthyl, and R_6 is H or C_{1-4} alkyl, or pharmaceutically acceptable salts, esters, or internal lactones thereof.

9. A method of treating an allergic/inflammatory disorder which comprises administering an effective amount of a compound according to claim 1.

4,513,006

ANTICONVULSANT SULFAMATE DERIVATIVES

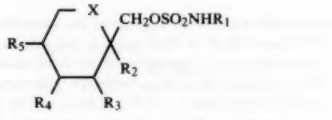
Bruce E. Maryanoff, New Hope, and Joseph F. Gardocki, Doylestown, both of Pa., assignors to McNeil Lab., Inc., Fort Washington, Pa.

Filed Sep. 26, 1983, Ser. No. 535,475

Int. Cl.³ A61K *31/35*; C07D *311/78, 311/94, 309/06*

U.S. Cl. 514—23 **12 Claims**

1. A sulfamate of the following formula (I):



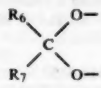
(I)

wherein

X is oxygen;

R_1 is hydrogen or alkyl; and

R_2, R_3, R_4 and R_5 are independently hydrogen or lower alkyl and R_2 and R_3 and/or R_4 and R_5 together may be a group of the following formula (II):



(II)

wherein

R_6 and R_7 are the same or different and are hydrogen, lower alkyl or are alkyl and are joined to form a cyclopentyl or cyclohexyl ring.

6. A pharmaceutical composition effective for the treatment of convulsions comprising an anticonvulsantly effective amount of a sulfamate of claim 1 and a pharmaceutically-acceptable carrier.

4,513,007

METHOD FOR TREATING HEART DISEASE

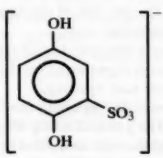
Alfred de Courten, Geneva; Adrian Schulthess, Begnins, both of Switzerland, and José Esteve-Soler, Barcelona, Spain, assignors to Laboratoires OM SA, Switzerland

Filed May 3, 1983, Ser. No. 491,295

Int. Cl.³ A61K *31/18*

U.S. Cl. 514—555 **7 Claims**

1. A method for treating a disorder selected from the group consisting of coronary heart disease, myocardial infarction and disturbances of the lymphatic circulation of the heart in a human or other animal, comprising administering to said human or other animal a therapeutically effective amount of a pharmaceutically acceptable salt selected from the group consisting of calcium, sodium, potassium, magnesium, diethylamine, ethanolamine and piperazine salts of the compound of formula



in a pharmaceutically acceptable carrier.

4,513,008

VIRUCIDAL COMPOSITIONS AND THERAPY

Emanuel Revici, New York, N.Y.; Bob E. Sherwood; Herman P. Benecke, both of Columbus, Ohio; John M. Rice, Westerville, Ohio, and Richard W. Geisler, Houston, Tex., assignors to The Vinoxen Company, Inc., Houston, Tex.

Filed Jul. 30, 1982, Ser. No. 404,199

Int. Cl.³ A61K *31/20, 31/11, 31/045*

U.S. Cl. 514—560 **16 Claims**

1. A method of inactivating enveloped virus, which comprises contacting said virus with a virucidally effective amount of a C_{20-24} linear polyunsaturated acid, aldehyde or primary alcohol having 5–7 double bonds, a pharmaceutically acceptable salt of said acid, or a mixture thereof.

4,513,009

AMINOACID DERIVATIVES AND THEIR THERAPEUTIC APPLICATIONS

Bernard Roques, Saint Maurice; Jean-Charles Schwartz, and Jeanne-Marie Lecomte, both of Paris, all of France, assignors to Societe Civile Bioprojet, Paris, France

Filed Apr. 14, 1981, Ser. No. 254,208

Claims priority, application France, Apr. 17, 1980, 80 08601

Int. Cl.³ A01N *37/12, 37/10*; C07C *153/00*

U.S. Cl. 514—513 **17 Claims**

1. A compound selected from the group consisting of:

N-[(R,S)-3-acetylthio-2-benzyl-propionyl]-glycine methyl ester;

N-[(R,S)-3-mercapto-2-benzyl-propionyl]-glycine;

N-[(R,S)-3-acetylthio-2-benzyl-propionyl]-L-alanine methyl ester;

N-[(R,S)-3-mercapto-2-benzyl-propionyl]-L-alanine;

O-benzyl,N-[(R,S)-3-mercapto-2-benzyl-propionyl]-L-serine;

N-[(R,S)-3-acetylthio-2-benzyl-propionyl]glycine benzyl ester;

N-[(R,S)-3-acetylthio-2-benzyl-propionyl]glycine p.fluorobenzyl ester;

N-[(R,S)-3-acetylthio-2-benzyl-propionyl]glycine 2,2,2-trifluoroethyl ester;

N-[(R,S)-3-acetylthio-2-benzyl-propionyl]glycine benzylamide;

N-[(R,S)-3-mercapto-2-benzyl-propionyl]glycine benzyl ester;

N-[(R,S)-3-mercapto-2-benzyl-propionyl]-glycine 2,2,2-trifluoroethyl ester;

N-[(R,S)-3-phenylacetylthio-2-benzyl-propionyl]-glycine benzyl ester; and

N-[(R,S)-3-benzylthio-2-benzyl-propionyl]-glycine benzyl ester.

4,513,010

METHOD OF TREATING NAVICULAR DISEASE IN HORSES

Lorimer J. Corbett, Sydney, Australia, assignor to Medical Research (Marketing) Pty, Ltd., North Ryde, Australia

Filed May 16, 1983, Ser. No. 495,111

Claims priority, application Australia, Jun. 18, 1982, PF4493

Int. Cl.³ A61K *31/135*

U.S. Cl. 514—651 **11 Claims**

1. A method of treating navicular disease in horses comprising the administration of an effective amount of Isoxsuprine over an extended period.

4,513,011

COMPOSITION IN THE FORM OF A SHAMPOO BASED ON ANTHRALIN

Jean-Francois Grollier, Paris; Georges Rosenbaum, Asnieres; Josiane Allec, Pierrefitte, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

Filed Oct. 22, 1982, Ser. No. 436,046

Claims priority, application France, Oct. 23, 1981, 81 19952; Apr. 5, 1982, 82 05864

Int. Cl.³ A61K *31/05*

U.S. Cl. 514—730 **5 Claims**

1. A shampoo composition for the treatment of the scalp which contains in aqueous solution or dispersion 0.01 to 5 percent by weight of anthralin, 8 to 47.5 percent by weight of an acid alkyl ester selected from the group consisting of ethyl myristate and acid alkyl esters in which the fatty acid has 5 to 18 carbon atoms and the alkyl radical has 3 to 18 carbon atoms, and 2.5 to 36 percent by weight of an anionic or nonionic surfactant, the composition being stable to oxidation for approximately one week when stored at a temperature of approximately +4° C.

4,513,012
POWDERED CENTER-FILLED CHEWING GUM COMPOSITIONS

Thomas J. Carroll, Astoria; Vincent G. Corsello, Albertson; Michael Glass, Flushing, and Dominic J. Piccolo, Brooklyn, all of N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 13, 1983, Ser. No. 494,215
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 **19 Claims**

1. A center-filled chewing gum piece comprising an outer-shell and a cavity enclosed therein, said cavity containing a powdered center-fill comprising at least one sweetener and a lubricant selected from the group consisting of magnesium stearate, talc and colloidal silica in an amount from about 0.75% to about 1.0% by weight of the center-fill weight.

4,513,013
PREPARATION OF MALT AND BEER HAVING A LOW NITROSAMINE CONTENT

Vas J. Aalbers, Leiden, Netherlands, assignor to Heineken Technisch Beheer, B.V., Zoeterwoude, Netherlands

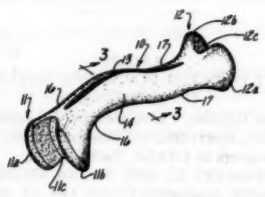
Continuation of Ser. No. 315,493, Oct. 27, 1981, abandoned, which is a continuation of Ser. No. 142,111, Apr. 21, 1980, abandoned. This application May 31, 1983, Ser. No. 498,036
Claims priority, application Netherlands, Mar. 28, 1980, 8001872
Int. Cl.³ C12C *1/00, 11/00*; A23L *1/202*
U.S. Cl. 426—16 **6 Claims**

1. In a malting process in which barley is moistened and kept at a germinating temperature until germinated barley is obtained, after which the germinated barley is kilned in a stream of heated air which is produced from low sulfur fuel and does not contain added sulphur dioxide, said kilning being continued until a dry malt is obtained, the improvement comprising producing a malt having a low nitrosamine level by treating the germinated barley up to 48 hours before the start of kilning with an aqueous liquid which contains from 0.2% to 0.8% by weight, based on the air-dry weight of the barley, of a carbohydrate material selected from the group consisting of monosaccharides and oligosaccharides.

4,513,014
CHEWABLE TOY FOR ANIMAL

Philip L. Edwards, 14615 Klenk, Detroit, Mich. 48215

Filed Oct. 11, 1983, Ser. No. 540,987
Int. Cl.³ A61J *17/00*
U.S. Cl. 426—132 **11 Claims**



1. A molded one-piece polyurethane dog bone having an elongated body and enlarged opposite end portions; said bone having opposite lateral surfaces and upper and lower surfaces curving in compound curvatures; said curvatures comprising said upper and lower surfaces of said elongated body extending in one direction from the mid-region of said body curving upwardly, the upper and lower surfaces of said body extending in the opposite direction from said mid-region curving downwardly, the upper and lower surfaces of the end portion in said one direction curving upwardly and downwardly respectively, the last named upper surface comprising a continuation of the upward curvature of said upper surface of said body, the last named lower surface recurving downwardly from the upward curvature of said lower surface of said body, the upper and lower surfaces of the end portion in said opposite direction curving upwardly and downwardly respectively, the last named upper surface recurving upwardly from the downward curvature of said upper surface of said body, and the last named lower surface comprising a continuation of the downward curvature of said lower surface of said body.

4,513,015
METHOD OF SEALING A CONTAINER AND REMOVING AIR HEADSPACE

Graham Clough, Maidenhead, England, assignor to Nestec, S.A., Vevey, Switzerland

Filed Feb. 9, 1982, Ser. No. 347,110
Claims priority, application United Kingdom, Feb. 27, 1981, 8106326
Int. Cl.³ B65B *31/00*
U.S. Cl. 426—396 **11 Claims**

1. A process for sealing a thermoplastic container having structure defining an opening at the top of the container and a rim surrounding said opening, there being a food product disposed within said container, said process comprising the steps of:

(a) sealing a microporous gas-permeable intermediate membrane to said rim so that said intermediate membrane covers said opening, there is a headspace between the intermediate membrane and the food product and there is a gas within such headspace,

(b) extracting said gas from the headspace by deforming the intermediate membrane into the headspace towards the food product to thereby reduce the volume of the headspace and force the gas out of the headspace through the intermediate membrane, and

(c) sealing a barrier membrane to the rim so that the sealed barrier membrane is superposed on the intermediate membrane and overlies said opening,

said intermediate membrane retaining the food product within the container during the gas-extracting step to thereby prevent contamination of said rim by said food product during such step.

4,513,016
NO-STIR DRY MIX WITH PUDDING NUGGETS FOR CAKE WITH DISCONTINUOUS PUDDING PHASE

Jon R. Blake, 6901 Regent Ave N., Brooklyn Center, Minn. 55429; Richard K. Knutson, 6948 Valley View Rd., Corcoran, Minn. 55340, and Glenn J. VanHulle, 7608 Major Ave. N., Brooklyn Park, Minn. 55443

Filed Oct. 6, 1982, Ser. No. 433,074
Int. Cl.³ A21D *13/08*
U.S. Cl. 426—554 **25 Claims**

1. A dry mix for cakes which requires no mixing or aeration prior to baking and which after baking forms a baked cake having a discontinuous pudding phase, comprising:

A. from about 70% to 90% by weight of the dry mix of a layer cake component comprising flour, sugar, leavening and flavor in the form of granules, said granules having

1. a particle size of from about 0.85 to 2.8 mm.,

2. a bulk porosity of from about 0.50 to 0.64,

3. a density of from about 0.45 to 0.70 g./cc.,

4. an initial rate of moisture absorption of from about 0.055 to 0.075 g. of water per gram of cake component per second, and
5. a moisture content of less than about 5% based on said cake component, and;

B. from about 10% to 30% by weight of the dry mix of a pudding component in the form of nuggets, said nuggets comprising a matrix of sugar and pudding granules, said granules having
1. a particle size of from about 0.9 to 3.35 mm.,
2. a bulk porosity of from about 0.50 to 0.60,
3. a density of from about 0.5 to 0.7 g./cc.,
4. an initial rate of moisture absorption of from about 0.060 to 0.080 g. of water per gram of pudding granule per second, and
5. a moisture content of less than about 5% based on said pudding component,

wherein the weight ratio of sugar to granules in the matrix ranges from about 1:4 to 1:7, and wherein the granules comprise sugar, flavoring and pregelatinized starch.

4,513,017

PROCESS FOR PRODUCING A SPREAD STARTING FROM A BIMODAL DISPERSED PHASE

David P. J. Moran, Covington, and David G. Sharp, Putnoe, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,985

Claims priority, application United Kingdom, Oct. 7, 1981, 3130324

Int. Cl.³ A23D *5/02*

U.S. Cl. 426—603 **16 Claims**

1. A process for producing an oil-in-water-in-oil emulsion, which comprises:

(i) producing a bimodal oil-in-water emulsion by
(a) preparing a cream comprising water, a stabilizing protein and oil in which the average diameter of the oil droplets ranges from 0.1 to 2 micrometers;
(b) adding to the cream thus obtained an amount of oil sufficient to cause the resulting mixture to comprise oil in the amount of 20 to 60 wt.% and applying an effective amount of shearing sufficient to ensure that oil droplets from the added oil are formed having an average diameter of at least 20 micrometers;

(ii) converting said bimodal emulsion into an oil-in-water-in-oil emulsion by applying conditions causing coalescence and crystallization of the larger oil droplets.

4,513,018

CONTINUOUS PRODUCTION OF CORN PRODUCTS

Manuel J. Rubio, 192 Benham Ave., Bridgeport, Conn. 06605

Continuation of Ser. No. 332,307, Dec. 18, 1981, abandoned, which is a division of Ser. No. 22,788, Mar. 22, 1979, Pat. No. 4,326,455. This application Aug. 3, 1983, Ser. No. 519,866

Int. Cl.³ A23L *1/10*

U.S. Cl. 426—622 **2 Claims**

1. A method for continuously making grain flour from corn kernels comprising the continuous and successive steps of

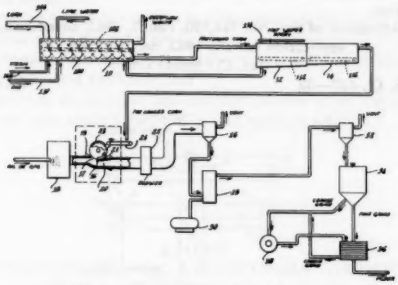
exposing said corn to a lime water solution to form an aqueous suspension and steeping the aqueous suspension under controlled conditions of heat at 86° to 94° C., for a time of 20–30 minutes and at an alkalinity of about 11.5,

passing the corn to a washer and washing the corn with water which is at a temperature of about 90° C. to remove any excess of lime-water from the corn and to impart heat to the corn for subsequent further processing,

passing the corn to a preconditioner wherein the corn is deposited on a conveyor and subjected to a transmit time through the preconditioner of at least about 35 minutes, the thickness of the layer and the time of transit being sufficient to cause the residual moisture constant of between 2% to 3% from between the corn kernels to be reabsorbed by the corn and to render the distribution of water within the corn kernels more nearly uniform cross-sectionally,

milling said corn into air-suspendable particles,

introducing said particles into a stream of super-heated air at a temperature of 550° C. to 650° C. and for a time which is sufficient partially gelatinize and cook the particles and



is sufficient to reduce the moisture content of the particles to 16% to 18%

cooling said particles while removing moisture therefrom to a content of about 9% to 12%,

segregating said particles into groups according to size, and collecting substantially all those among said particles which are of less than a predetermined size.

4,513,019

FILM-FORMING COMPOSITIONS FOR ENVELOPING SOLID FORMS, PARTICULARLY PHARMACEUTICAL OR FOOD PRODUCTS OR SEEDS, AND PRODUCTS OBTAINED, COATED WITH SAID COMPOSITIONS

Bernard Brancq, Le Chesnay, and Michel Malandain, Marly le Roi, both of France, assignors to SEPPIC, Paris, France

Filed Jul. 3, 1984, Ser. No. 627,665

Claims priority, application France, Jul. 6, 1983, 83 11276

Int. Cl.³ G01N *25/00;* **A61K** *9/36*

U.S. Cl. 427—3 **8 Claims**

1. A process for enveloping solid forms such as pharmaceuticals, food products or seeds with a film-forming composition, comprising the steps of:

making a solution or dispersion of the components of a film-forming composition comprising, by weight, 15 to 85% of a cellulosic film-forming substance, 10 to 70% of at least one alpha-cellulose, and 5 to 30% of at least one plasticizer suitable for consumption; and

spraying said solution or dispersion on the form to be enveloped.

4,513,020

PLATELET METAL POWDER FOR COATING A SUBSTRATE

James Dickson, Stirling, N.J., and Charles Hays, Pearland, Tex., assignors to Allied Corporation, Morris Township, N.J.

Division of Ser. No. 285,885, Jul. 22, 1981, abandoned. This application Apr. 8, 1983, Ser. No. 483,330

Int. Cl.³ B05D *1/00;* **B22F** *1/00*

U.S. Cl. 427—34 **3 Claims**

1. A method for depositing a coating free from interconnected porosity onto a substrate comprising:

(a) selecting an alloy based on Fe, Ni, Co or a combination thereof, said alloy being powder in platelet form, said powder being formed by fracturing of a brittle alloy and said powder having a particle size distribution such that at least 50% will not pass through a 270 Tyler mesh sieve and up to 15 percent will pass through an 80 Tyler mesh sieve but not through a 100 Tyler mesh sieve;

(b) processing said powder by passing it through a torch; and

(c) depositing said processed powder onto a substrate.

4,513,021

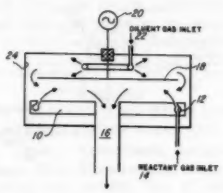
PLASMA REACTOR WITH REDUCED CHAMBER WALL DEPOSITION

Andrew J. Purdes, and Thomas D. Bonifield, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 344,590, Feb. 1, 1982, abandoned. This application Nov. 7, 1983, Ser. No. 549,217

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **6 Claims**



1. A method for plasma-assisted deposition of materials, comprising the steps of:

providing a plasma reactor having a reaction chamber defined at least in part by sidewalls and including therein a substrate holder and an electrode parallel to and opposed to said substrate holder in spaced relation therewith;

introducing reactant gases into the reaction chamber of said plasma reactor at a first location and in a manner directing the reactant gases over the circumference of said substrate holder and radially inwardly with respect thereto, wherein said reactant gases are of respective chemical identities to produce a desired chemical material deposition as a reaction from a plasma formed therefrom;

creating an electric field within the reaction chamber in the space between said electrode and said substrate holder;

forming a plasma from the reactant gases in response to the creation of the electric field within the reaction chamber in the space between said electrode and said substrate holder;

exposing a substrate on said substrate holder to said plasma;

depositing the desired chemical material from said plasma as a coating on said substrate;

introducing diluent gas into the reaction chamber of said plasma reactor separately from the introduction of said reactant gases but while said reactant gases are being introduced into the reaction chamber at a second location apart from the space between said electrode and said substrate holder and different from said first location and in a manner directing the diluent gas flow along the internal sidewall surfaces of the reaction chamber in substantially circumferentially symmetric relation with respect to said substrate holder so as to deter the deposition of the desired chemical material from said plasma onto the internal sidewall surfaces of the reaction chamber; and

exhausting gases of the reacted plasma and the diluent gas from the reaction chamber via a location near the center of said substrate holder.

4,513,022

PROCESS FOR AMORPHOUS SILICON FILMS

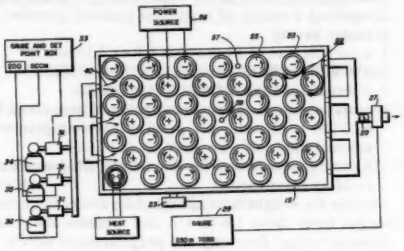
Frank Jansen, Walworth, and Joseph Mort, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 456,935, Jan. 10, 1983, Pat. No. 4,466,380. This application May 25, 1984, Ser. No. 614,006

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—39 **4 Claims**

1. A process for preparing amorphous silicon photoconductors which comprises providing a vacuum chamber, containing therein a first electrode means, and a second counter electrode means, providing a cylindrical member on the first electrode means, heating the cylindrical member with heating elements contained in the first electrode means, to a temperature ranging from about 100° C. to about 300° C., causing the first electrode means to axially rotate, introducing a silane gas into the chamber means at a crossflow direction with respect to the cylindrical member, applying a current to the first electrode means, applying a current to the second electrode means, whereby the silane gas introduced is decomposed causing deposition of amorphous silicon on the cylindrical surface.



4,513,023

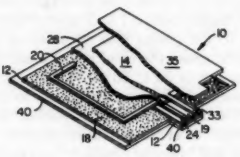
METHOD OF CONSTRUCTING THIN ELECTROLUMINESCENT LAMP ASSEMBLIES

John Wary, Noblesville, Ind., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 23, 1983, Ser. No. 468,936

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **19 Claims**



1. A method of constructing a thin electroluminescent lamp comprising the steps of:

(a) screen printing a band of silver conductive material substantially around the edges of a circumscribed area of a transparent conductive substrate with said area conforming to the desired configuration for the lamp and with said band forming an electrical bus bar for the lamp;

(b) forming an insulated support area over a section of said transparent conductive substrate extending from said silver conductive bus bar;

(c) depositing a finger-like section of silver conductive material over said insulated support area and extending from said bus bar to form a first electrical lead;

(d) forming a UV curable dielectric matrix by loading nonencapsulated particles of electroluminescent phosphor into a UV curable dielectric composition;

(e) depositing a coating of said UV curable dielectric composition over said circumscribed area of the transparent conductor and over said silver conductive bus bar;

(f) curing said coating composition by exposure to a source of ultraviolet light in a substantially inert atmosphere;

(g) superimposing a layer of a nontransparent conductive material over the surface of the UV curable dielectric coating with said nontransparent conductive layer having an elongated finger-like section extending over said insu-

lating support area to form a second electrical lead laterally spaced from said first electrical lead; and

(h) applying a protective coating over said conductive layer and at least a portion of said first and second electrical leads.

4,513,024

PROCESS FOR FORMING PHOSPHOR SCREEN

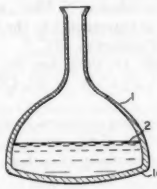
Yasukazu Morita, and Naomitsu Watanabe, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,679

Claims priority, application Japan, Aug. 21, 1981, 56-130108

Int. Cl.³ B05D *5/06, 5/12*

U.S. Cl. 427—65 **10 Claims**



1. In a process for forming a phosphor screen on a cathode-ray tube faceplate by a settling process using a suspension of phosphor particles, the improvement which comprises using as the suspension one obtained by suspending phosphor particles which are susceptible to hydrolysis or dissolution in an alkaline aqueous solution which has a pH of 10 to 13 and contains a small amount of water glass.

4,513,025

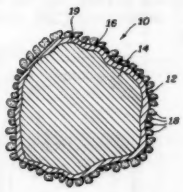
LINE EMISSION PENETRATION PHOSPHOR FOR MULTICOLORED DISPLAYS

Thomas E. Clark, Acton, and Charles T. Burilla, Southboro, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed May 11, 1982, Ser. No. 377,120

Int. Cl.³ B05D *5/06;* **H01J** *31/20*

U.S. Cl. 427—68 **11 Claims**



1. A method for making a coated cathodoluminescent line emission penetration phosphor particle having a central region consisting of La_2O_2S:Tb, a non-luminescent barrier region substantially uniformly surrounding said central region consisting substantially of $La_2O_2SO_4$:Tb and forming a core particle with said central region and a layer of coating particles consisting substantially of YVO_4-Eu surrounding said barrier region, comprising the steps of:

selecting a host material consisting of particles of La_2O_2S:Tb with a diameter greater than the diameter of said coating particles;

oxidizing ones of said host particles to form said barrier region thereover in a thickness of about 0.5 to 1 micron thereby forming a plurality of core particles;

acidifying a first solution of gelatin with glacial acetic acid to pH in the range of 3 to 5;

agitating said core particles in said first acidified gelatin solution in a concentration of 0.1 gm/ml for a period of about 25 min. to apply a first gelatin coating;

removing an excess of said first acidified gelatin solution;

selecting a quantity of YVO_4:Eu substantially free of absorptive film material and having a ratio by weight to said core particles of about 1:3 and a particle size of about 0.5 to 2 microns and agitating in an aqueous solution having a pH of about 3.9;

agitating said core particles in said aqueous solution and said coating particles for about 25 min. sufficient to cause said coating particles to coat said core particles in at least a single layer thickness; and

removing an excess of said aqueous solution from said core and said coating particles in said aqueous solution.

4,513,026

METHOD FOR COATING A SEMICONDUCTOR DEVICE WITH A PHOSPHOSILICATE GLASS

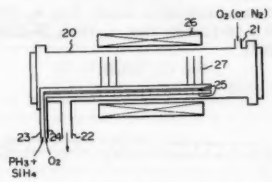
Hidekazu Miyamoto, Sagamihara; Yoshimi Shioya, Yokohama; Mamoru Maeda, Tama, and Mikio Takagi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 295,618, Aug. 24, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 518,329

Claims priority, application Japan, Aug. 29, 1980, 55-119357; Nov. 5, 1980, 55-155361

Int. Cl.³ H01L *21/316*

U.S. Cl. 427—85 **9 Claims**



1. A method for manufacturing semiconductor devices in a reaction tube provided with a gas inlet adjacent one end of the reaction tube, a gas outlet adjacent the opposite end of the reaction tube and at least two gas feed pipes having plural small openings pierced along the longitudinal direction thereof, comprising the steps of:

(a) positioning plural substrates for the semiconductor devices to be treated in the reaction tube so that the main surfaces of the plural substrates are substantially vertically aligned with respect to one another and are substantially perpendicularly intersected by the longitudinal axis of the reaction tube;

(b) introducing a silicon compound gas including a phosphorus compound gas through one of the at least two gas feed pipes having plural small openings into the reaction tube and introducing an oxidizing gas through the other of the at least two gas feed pipes out the plural small openings into the reaction tube, while maintaining the inside of the reaction tube under a reduced pressure by evacuating the inside of the reaction tube through the gas outlet; and

(c) introducing a gas into the reaction tube through the gas inlet to establish a gas flow, for the gases introduced into the reaction tube in said steps (b) and (c), in a direction along the longitudinal axis of the reaction tube from the gas inlet, via the periphery of the plural substrates, toward the gas outlet to expose the plural substrates to the gas flow, whereby phosphosilicate glass films are deposited on the main surfaces of the plural substrates.

4,513,027

UPC SCANNABLE MARKING COMPOSITION AND APPLICATIONS THEREOF

William T. Skukowski, Palmetto, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.

Division of Ser. No. 335,400, Dec. 29, 1981, Pat. No. 4,431,693.
This application Feb. 9, 1984, Ser. No. 578,505
Int. Cl.[3] B05D *5/06;* B41M *1/26, 1/34, 1/40*
U.S. Cl. 427—162 12 Claims

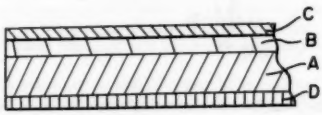
1. A process for marking a substrate exhibiting low reflectance in the visible and infrared region of from about 600 to about 1000 nm with a symbol suitable for use with code indicia scanning apparatus comprising imprinting indicia on said substrate in a negative mode so that the imprinted indicia comprise the reflective portion of the symbol and the voids between the printed indicia comprise the low reflective portion of the symbol, wherein the indicia are imprinted with a marking composition comprising a white pigment which reflects in said visible and infrared region and a colored pigment exhibiting insufficient reflectance itself in said visible and infrared region to be suitable for the reflective portion in a code symbol to be processed by a code indicia scanning means, with said pigments being present in amounts sufficient to provide a contrast in reflectance with the substrate suitable for processing by code indicia scanning apparatus.

4,513,028

ADHESIVE TAPE AND PROCESS FOR ITS PRODUCTION

Toshiyuki Aritake, Nagahama, Japan, assignor to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Division of Ser. No. 397,237, Jul. 12, 1982, Pat. No. 4,447,485.
This application Mar. 5, 1984, Ser. No. 567,870
Claims priority, application Japan, Aug. 4, 1981, 56-122294; Aug. 10, 1981, 56-125129; Oct. 5, 1981, 56-158439; Nov. 30, 1981, 56-192052
Int. Cl.[3] B32B *31/16*
U.S. Cl. 427—173 5 Claims



1. A process for producing an adhesive tape which comprises forming an adhesive layer on one side of a base sheet of a polypropylene resin and a surface layer of a polypropylene resin having a melting point lower than that of the polypropylene resin of the base sheet and containing fine inorganic filler particles, on the other side of the base sheet to obtain an unstretched laminated sheet, and stretching the laminated sheet at a temperature of at least the melting point of the polypropylene resin of the surface layer to bring the thickness of the surface layer to be not more than the maximum particle diameter of said fine inorganic filler particles.

4,513,029

SEA WATER ANTIFOULING METHOD

Takaaki Sakai, Suita, Japan, assignor to Osaka Suda Co. Ltd., Osaka, Japan

Filed Jul. 18, 1983, Ser. No. 514,786
Claims priority, application Japan, Jul. 16, 1982, 57-124739
Int. Cl.[3] B05D *5/04*
U.S. Cl. 427—204 11 Claims

1. A method for preventing fouling of a structure which may be in contact with sea water, which comprises coating an antifouling coating composition composed of

(a) an alkali silicate as a binder,

(b) about 15 to about 400% by weight, based on the amount of SiO_2 in component (a), of active magnesium oxide having an iodine adsorption of about 30 to about 300 mg.I/g.MgO,

(c) 0 to less than 15% by weight, based on the total amount of components (b) and (c), of calcium sulfite, and

(d) 0 to about 900% by weight, based on the total amount of components (b) and (c), of at least one member selected from the group consisting of metallic zinc and inorganic zinc compounds, on at least that portion of said structure which may be contacted with sea water, thereby preventing fouling marine organisms from attaching themselves to said contacting portion.

4,513,030

METHOD OF PRODUCING SILICON CARBIDE ARTICLES

John V. Milewski, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 18, 1982, Ser. No. 389,802
Int. Cl.[3] B05D *3/10;* C23C *11/08;* C04B *35/54, 35/80*
U.S. Cl. 427—227 4 Claims

1. A method of forming a shaped product having a surface layer of silicon carbide (SiC) reaction bonded to an inner structure consisting essentially of carbon, comprising the steps of:

(a) generating SiO gas at a concentration of between about 5 and 50 volume percent by heating solid silicon dioxide (SiO_2) to a reaction temperature of between approximately 1500° and 1550° C. in an atmosphere of hydrogen, said solid silicon dioxide being in the form of a powder surrounding said structure:

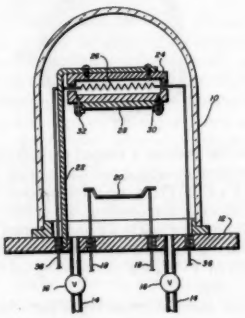
(b) contacting said structure with said SiO gas at said reaction temperature of between approximately 1500° C. and 1550° C. for a period of time sufficient to form a layer of SiC on the surface of said structure by chemical conversion of carbon in said structure to SiC, whereby a layer of reaction-bonded SiC is formed on the surface of said structure without significantly changing the dimensions of said structure.

4,513,031

PROCESS FOR FORMING ALLOY LAYER

Lewis B. Leder, Chapel Hill, N.C., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 9, 1983, Ser. No. 530,841
Int. Cl.[3] B05D *5/12;* C23C *11/00, 13/00*
U.S. Cl. 427—250 21 Claims



1. A method of forming an alloy layer on the surface of a substrate comprising forming in a vessel a molten bath comprising at least one vaporizable alloying component having a higher vapor pressure than at least one other vaporizable alloying component in said bath, forming a thin, substantially inert, liquid layer of an evaporation retarding film forming material on the upper surface of said molten bath, co-vaporiz-

ing at least a portion of both said vaporizable alloying component having a higher vapor pressure and said other vaporizable alloying component whereby said evaporation retarding film retards the initial evaporation of said vaporizable alloying component having a higher vapor pressure, and forming an alloy layer comprising both said vaporizable alloying component having a higher vapor pressure and said other vaporizable alloying component on said substrate.

4,513,032

PRODUCING A SOLID POLYMERIC ELECTROLYTE

Peter R. Klinkowski, Norwalk, Conn., assignor to Dorr-Oliver, Stamford, Conn.

Division of Ser. No. 285,196, Jul. 20, 1981, Pat. No. 4,419,209. This application Aug. 23, 1983, Ser. No. 481,870

Int. Cl.³ B05D *3/10;* **C08D** *5/20;* **B01D** *39/00, 39/14*

U.S. Cl. 427—336 **10 Claims**

1. A method for making a solid polymeric electrolyte member composed of three phases, comprising mixing an ion exchange resin, an organic binder and an organic solvent, impregnating a fibrous, woven or unwoven, substantially inert substrate with the resin-binder-solvent mixture and thereafter contacting the impregnated substrate with a diluent to effect precipitation of said binder from solution, thereby removing solvent and leaving a thin film of ion exchange resin tightly bonded by said binder to said fibrous substrate.

2. The method of claim 1 wherein the ion exchange resin is in the form of fine particles and the diluent is water.

4,513,033

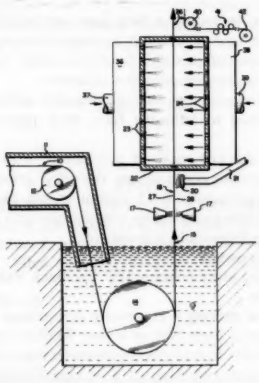
DIFFERENTIALLY COATED GALVANIZED STEEL STRIP AND METHOD AND APPARATUS FOR PRODUCING SAME

Ram S. Patil, Munster; Donald F. Johnson, Hammond, and John T. Quasney, East Chicago, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jan. 20, 1984, Ser. No. 572,386

Int. Cl.³ C23C *1/02*

U.S. Cl. 427—349 **16 Claims**



1. A method for producing a differentially coated, galvanized steel strip wherein one of two opposite strip sides has a relatively light coat composed of iron-zinc alloy and the other strip side has a relatively heavy coat at least the outer part of which consists essentially of zinc without surface bleed-throughs of iron-zinc alloy, said method comprising the steps of:

passing a steel strip having two opposite sides through a bath of molten coating metal consisting essentially of zinc to coat both sides of the strip with said molten coating metal;

adjusting the weight of said coating metal on opposite sides of the strip to provide one strip side with a relatively light coat of the coating metal and the other strip side with a relatively heavy coat of said coating metal, said heavy coat being at least partially molten;

simultaneously heating said one strip side and cooling said other strip side to transform the coating metal on said one strip side to iron-zinc alloy throughout while only partially transforming the coating metal on the other strip side to iron-zinc alloy;

and preventing intermittent bleed-throughs of iron-zinc alloy on said other strip side by precooling said other strip side between said weight adjusting step and said simultaneous heating and cooling step;

said precooling step comprising substantially fully solidifying the molten coating metal on said other strip side before the start of said simultaneous heating and cooling step.

4,513,034

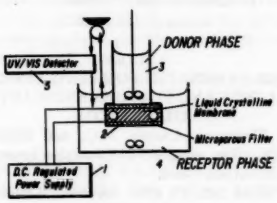
VARIABLE PERMEABILITY LIQUID CRYSTALLINE MEMBRANES

Randall V. Sparer, and Ravi K. Bhaskar, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 14, 1984, Ser. No. 620,409

Int. Cl.³ C09K *3/34;* **G02F** *1/13*

U.S. Cl. 428—1 **9 Claims**



1. A variable permeability liquid crystalline membrane, comprising a porous structure containing a polymeric liquid crystal which can undergo a phase change.

4,513,035

ORNAMENT

Michelle D. Barfield, and George Spector, both of 233 Broadway, Rm 3615, New York, N.Y. 10007

Filed Sep. 26, 1983, Ser. No. 535,767

Int. Cl.³ G10K *1/00*

U.S. Cl. 428—11 **2 Claims**

1. An ornament simulating a bell comprising:

(a) a hollow generally conical shaped inverted cup having an aperture in top portion, an outer skin forming an exterior surface and an open bottom mouth thereof;

(b) an outer covering placed about the exterior surface of said cup, said covering having an aperture in alignment with the aperture in said cup;

(c) a decorative element being spheroidal in shape simulating a bell clapper; and

(d) a hanger element disposed through the aperture in said outer covering and the aperture in said cup, one end of said hanger element affixed to said decorative element with other end of said hanger element extending outwardly from the top portion of said cup for attachment to a support from which said ornament is adapted to be supported, further comprising a trim placed about bottom edge of said outer covering to form an ornamental design thereof, wherein said outer covering and said trim is made of cloth material, said cloth material of said outer covering being of a different color than said cloth material of said trim, wherein said decorative element is a very small bell to make a series of light clinking sounds like a tinkle, wherein said hanger element is a strand of material and said cup is made of molded cellular polystyrene material, wherein

(e) two ribs, one rib formed around middle of the exterior surface and the other rib formed around bottom of the exterior surface near the open bottom mouth so that said ribs will give support to said cup and enable said cloth material to better engage the exterior surface of the cup; and

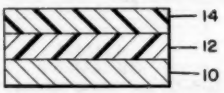
(f) a plurality of pin hooks placed around the exterior surface so that said pin hooks can engage said cloth material and enhance the design of the ornament.

4,513,036

BARRIER LAMINATES FOR CONTAINMENT OF ESSENTIAL OILS AND FLAVORS AND CARTONS MADE THEREFROM

Kenneth P. Thompson, Canton, N.C., and Richard C. Ihde, Strongsville, Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 17, 1983, Ser. No. 542,490
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—35 **24 Claims**



1. A container for liquids containing essential oils and/or flavors constructed from laminate a comprising an outer paperboard layer, a layer of propylene poiymer coated on an inner surface of said paperboard layer, and propylene polymer layer having an inner surface which has been treated to enhance adhesion, and a heat sealable layer of an olefin polymer coated on said treated inner surface of said propylene polymer layer.

4,513,037

MULTILAYERED HOLLOW POLYCARBONATE CONTAINERS

Patrick C. Collins, Pittsfield, Mass., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 29, 1983, Ser. No. 566,513
Int. Cl.³ B65D *1/00*; B32B *27/36*
U.S. Cl. 428—35 **15 Claims**

1. A multi-layered hollow container containing at least three layers comprised of:

(i) a polycarbonate inner layer comprised of at least one ply of a polycarbonate resin;

(ii) a polycarbonate outer layer comprised of at least one ply of a polycarbonate resin; and

(iii) an intermediate layer disposed between said inner layer and said outer layer comprised of at least one ply of a thermoplastic resin exhibiting gas-barrier properties.

4,513,038

MULTILAYER FILM HAVING A LAYER OF LOW PRESSURE, LOW DENSITY HETEROGENEOUS ETHYLENE COPOLYMERS

John Anthony, Downers Grove, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 317,936, Nov. 3, 1981, Pat. No. 4,464,426. This application Feb. 7, 1984, Ser. No. 577,801
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—35 **21 Claims**

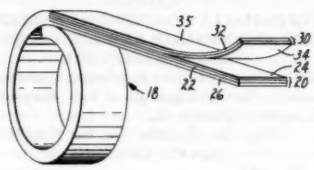
1. A coextruded multilayer film comprising a first outer layer of low pressure, low density gas phase heterogeneous copolymers formed from ethylene and at least one of propylene and butene-1 and at least one C_5–C_8 comonomer, and a second outer layer comprising high pressure, low density polyethylene, said copolymers having a melt index of between about 0.5 and about 5.0 decigrams per minute, and a density of between about 0.91 and about 0.94 grams per cubic centimeter.

4,513,039

COMPOSITE OF SEPARABLE PRESSURE-SENSITIVE ADHESIVE TAPES

Donald L. Esmay, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 439,047, Nov. 3, 1982,. This application Apr. 4, 1983, Ser. No. 481,814
Int. Cl.³ C09J *7/02*; A61F *13/02*
U.S. Cl. 428—40 **16 Claims**



1. Composite including a first tape comprising a flexible support on each face of which is a pressure-sensitive adhesive, and a second tape comprising a flexible support, on at least one face of which is pressure-sensitive adhesive,

said first and second tapes being releasably adhered together adhesive face to adhesive face, each pressure-sensitive adhesive

(a) being the polymerized product of a predominantly alkyl acrylate composition, the alkyl groups of which have an average of 4–12 carbon atoms, each said composition being physically compatible with the other,

(b) being substantially solvent-free,

(c) being crosslinked, and

(d) affording at each face a 180° Peelback Value of at least 10 N/dm.

11. Method of making a composite comprising the steps of

(1) coating onto each face of a first flexible support a substantially solvent-free photopolymerizable mixture,

(2) coating onto one face of a second flexible support a substantially solvent-free photopolymerizable mixture, each said photopolymerizable mixture being physically compatible with the other said mixture and comprising an alkyl acrylate, the alkyl groups of which have an average of 4–12 carbon atoms, and a crosslinker, and

(3) exposing each coating to ultraviolet radiation to polymerize the acrylate to provide a pressure-sensitive adhesive layer which

(a) is crosslinked and

(b) affords at each face a 180° Peelback Value of at least 10 N/dm,

(4) superimposing the resulting two tapes adhesive face to adhesive face, which two tapes can later be peeled apart

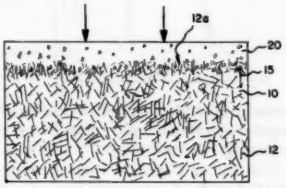
without delamination or offsetting of adhesive and used separately.

4,513,040

HIGHLY WEAR-RESISTANT STEEL FIBER REINFORCED CONCRETE TILES

David R. Lankard, Columbus, Ohio, assignor to Ribbon Technology, Inc., Gahanna, Ohio

Filed Apr. 22, 1983, Ser. No. 488,241
Int. Cl.³ B32B *13/02*
U.S. Cl. 428—49 18 Claims



1. A heavy duty, wear, crack and spall-resistant concrete composite floor tile comprising:

a concrete substrate layer containing 4 to 16 volume percent of dispersed, fine, metal fibers, and

a wear-resistant concrete surface layer containing about 30 to 60 volume percent of wear-resistant, metallic aggregate or an inorganic aggregate having a Mohs hardness of at least 7,

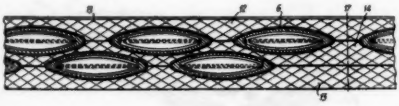
said tile being further characterized in that the layers are bonded to each other by a plurality of metal fibers in said substrate layer having one end embedded in and bonded to the substrate layer and the other end embedded in and bonded to the surface layer.

4,513,041

TUBULAR VACUUM-TIGHT ENCLOSURES FOR THERMAL AND ACOUSTICAL INSULATING PANELS

Rene E. Delluc, 2, Square du Berry, 91 300 Massy, France

Filed Aug. 12, 1983, Ser. No. 522,850
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—69 10 Claims



1. A cell for insulating panels comprising:

plastic gas impervious flexible sheath, having first and second sealed ends; and

at least one rigid hollow, plastic tubular element having first and second ends, said tubular element being disposed within said sheath;

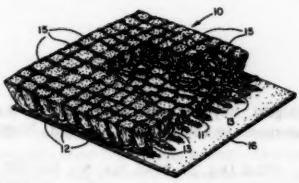
wherein said sealed sheath and tubular element have been substantially evacuated.

4,513,042

NONFLAMMABLE SLIVER KNIT HIGH PILE FABRIC

Douglas S. Lumb, Methuen, Mass., assignor to Glenoit Mills, Inc., New York, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,291
Int. Cl.³ B32B *3/02*
U.S. Cl. 428—95 7 Claims



1. A nonflammable sliver knit high pile fabric characterized by

(a) a backing fabric knitted from flame retardant aramid spun yarn,

(b) pile fibers composed of a mixture of flame retardant rayon fibers and superwashed wool fibers,

(c) said mixture of fibers falling within the general range of 55% to 70% of said rayon fibers and 45% to 30% of said wool fibers, and

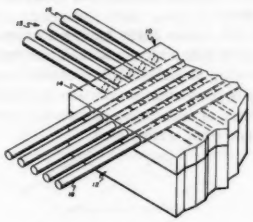
(d) a back coating composed of a flame retardant composition.

4,513,043

PRECISION WIRE GRID GLASS DIGITIZING TABLETS

Jack E. Smades, Scottsdale, Ariz., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 8, 1982, Ser. No. 433,602
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—113 11 Claims



1. An improved wire grid glass tablet for translating graphic location or movement information into corresponding electrical signals comprising:

a flat glass plate forming a structural base for the tablet;

a resin layer bonded to one surface of the glass plate;

a first grid of accurately spaced parallel wires immersed in the resin layer and arranged in a common plane parallel to the plane of the glass plate, said wires comprising a ductile material, said wires having been tensioned to beyond the yield point thereby exhibiting plastic flow and straightness;

a second grid of parallel wires immersed in the resin layer and spaced from the first grid, said second grid comprising accurately spaced parallel wires in a common plane parallel to the plane of the glass plate and the plane of the first grid, said second grid also comprising wires of ductile material, said wires having been tensioned to the yield point thereby exhibiting plastic flow and straightness;

said resin layer being relatively thin with respect to the glass

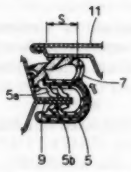
plate and comprising a thickness in the cured state resulting from curing a layer of uncured at least partially settled resins supported on the glass plate when level under gravity and surface tension prior to immersing said grids in said resin layer.

4,513,044

COLORED WEATHER STRIP

Kiyoshi Shigeki, Shyuchi, and Kunio Maeno, Ama, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugaigun, Japan

Filed Dec. 29, 1983, Ser. No. 566,707
Claims priority, application Japan, Dec. 30, 1982, 57-198222
Int. Cl.³ E06B 7/16
U.S. Cl. 428—122 **1 Claim**



1. A colored weather strip for attachment to a flange on an automobile body defining a door opening, said strip comprising:

a sealing portion formed from sponge rubber and having an outer surface including a door sealing area;

a U-shaped trim portion joined integrally with said sealing portion, formed from solid rubber;

a metal core being embedded in said solid rubber of said trim portion; and

a colored solid rubber layer having a color which differs from those of said sealing and trim portions, said colored layer covering an outer surface of said trim portion and extending beyond said trim portion to cover a part of said cover surface of said sealing portion to a point close to but not into said door sealing area.

4,513,045

SHEET TYPE FELT

Alfredo A. Bondoc, South Bound Brook; Eugene J. Flood, Haddonfield, and Frederick W. Sieling, Bound Brook, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Division of Ser. No. 595,881, Apr. 2, 1984,. This application Aug. 3, 1984, Ser. No. 637,640
Int. Cl.³ B32B 3/10
U.S. Cl. 428—137 **8 Claims**

1. Rigid foamed insulation board comprising:

(a) a rigid closed cell foam core; and

(b) sheet type felt adhered to a face of said core, said felt comprising on a dry basis:

(1) between about 40 and about 80 wt % cellulosic fibers;

(2) between about 5 and about 20 wt % glass fibers;

(3) between about 5 and about 15 wt % binder; and

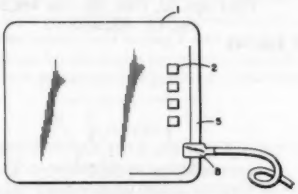
(4) between about 3 and about 20 wt % asphalt.

4,513,046

ANTISTATIC SUPPORT

Kurt Waniek, Purkersdorf, and Heinz Tichy, Vienna, both of Austria, assignors to Semperit Aktiengesellschaft, Traiskirchen, Austria

PCT No. PCT/AT81/00032, § 371 Date Aug. 2, 1982, § 102(e) Date Aug. 2, 1982, PCT Pub. No. WO82/02315, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 18, 1981, Ser. No. 406,238
Claims priority, application Austria, Dec. 22, 1980, 6240/80
Int. Cl.³ B25H 3/06, 1/10
U.S. Cl. 428—156 **11 Claims**



1. An antistatic grounded support for work places serving for the manipulation of electronic components, said antistatic support comprising:

a rubber layer having a specific volume resistance (according to DIN 53482) of at least 10^2 Ωcm, a sufficiently low surface resistance for conducting away any static charges which may accumulate thereon, and defining two surfaces;

at least a portion of one of said two surfaces of said rubber layer is provided with recesses having a bottom and serving for the reception of waste materials;

said one of said two surfaces of the rubber layer constituting the top surface thereof which is used for performing work thereupon; and

each said recess having, in top plan view, a dimension of at least 8 mm in at least one direction;

said recesses each have a depth in the range of 2 to 5 mm;

webs formed between said recesses; and

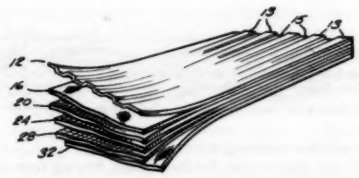
each said web having a width of material between the recesses in the range of 1 to 5 mm.

4,513,047

SORBENT INTERNALLY RIBBED CARBON-CONTAINING MATERIAL AND PROTECTIVE GARMENT FABRICATED THEREFROM

Jack Leach, Greensboro, and Delbert A. Davis, Kernersville, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 23, 1984, Ser. No. 572,751
Int. Cl.³ B32B 1/00
U.S. Cl. 428—175 **12 Claims**



1. A laminate suitable for fabricating garments, comprising:

at least one layer of a woven activated carbon fabric;

an absorbent body-side rayon layer which underlays said at least one carbon fabric layer; and

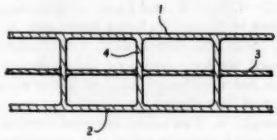
an innermost layer of a fabric material having a plurality of

ribs which form perspiration-conducting channels, said innermost layer underlying said body-side rayon layer.

4,513,048
WEBBED MULTIPLE SHEETS

Peter Kaube, Rossdorf; Karl-Heinz Schanz, Muehltal; Heinz Vetter, Rossdorf, and Jens Müller, Griesheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,133
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 8225408[U]
Int. Cl.³ B32B *3/26, 27/08*
U.S. Cl. 428—188 **6 Claims**

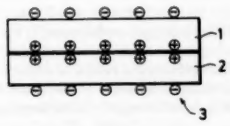


1. Webbed multiple sheets comprising two substantially parallel, substantially plane polymethylmethacrylate outer layers and at least one center layer between said outer layers, wherein said outer layers and said center layers are bonded together into one piece by webs and wherein said said center layer or layers comprise a thermoplastic material having increased tenacity, increased zero viscosity or a combination thereof in molten condition, as compared with the material of said outer layers, thereby reducing sagging of said center layer or layers during extrusion, and wherein said thermoplastic material of said center layer or layers is selected from the group consisting of polycarbonates, polysulfones, thermoplastic polyesters and fluoropolymers.

4,513,049
ELECTRET ARTICLE

Kazuyuki Yamasaki, Iwakuni, and Fukashi Kagawa, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,890
Int. Cl.³ B32B *3/02*
U.S. Cl. 428—194 **10 Claims**



1. An electret article comprising a laminate of a plurality of electret plastics films, said films being laminated together, the number of films in said plurality of films being an even number, with the juxtaposed internal surfaces of said films facing each other within said laminate being of the same polarity, said laminate having the same polarity on both external surfaces, each of said films having opposite polarities on opposite surfaces.

4,513,050
MATERIAL FOR PACKAGING LIGHT-SENSITIVE MATERIALS

Mutsuo Akao, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

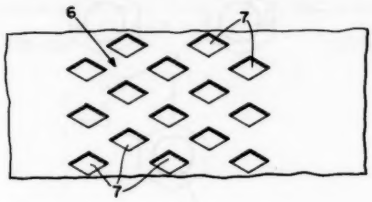
Filed Apr. 22, 1983, Ser. No. 487,567
Claims priority, application Japan, Apr. 26, 1982, 57-68620
Int. Cl.³ B32B *27/00, 27/16*
U.S. Cl. 428—200 **14 Claims**

1. A material for packaging light-sensitive materials composed of a composite sheet comprising a substrate coated with at least a middle layer and at least a surface layer through melt co-extrusion, said surface layer being of thermoplastic resin which is heat sealable and yet has larger neck-in and which is selected from the group consisting of ethylene-vinyl acetate copolymer containing not more than 93 wt % ethylene, ethylene-acrylate copolymer containing not more than 93 wt % ethylene, ethylene-methacrylate copolymer containing not more than 93 wt % ethylene, linear low-density polyethylene, ionomer and mixtures thereof, said middle layer being of thermoplastic resin having small neck-in and good adhesion to the substrate and which is selected from the group consisting of low-density polyethylene, moderate-density polyethylene, high-density polyethylene, polypropylene, ethylene-acrylate copolymer containing not less than 95 wt % ethylene, ethylene-methacrylate copolymer containing not less than 95 wt % ethylene, ethylene-vinyl acetate copolymer containing not less than 95 wt % ethylene and mixtures thereof, and one or more layers of said composite sheet containing light-shielding material.

4,513,051
TISSUE PAPER PRODUCT

Bruce W. Lavash, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 5, 1984, Ser. No. 568,475
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—212 **5 Claims**



1. A personal care product comprising a planar substrate and an emollient carried by said substrate; said substrate comprising a laminate; said laminate comprising at least two plies of tissue paper in juxtaposed relation; at least one of said plies comprising a first layer and a second layer; said first layer being weak relative to said second layer and having its outwardly facing surface soft, relatively untextured, and smooth; said second layer being sufficiently strong to impart sufficient strength to said ply to enable it to perform its intended function; said plies being oriented in said laminate so that said outwardly facing surface of said first layer forms one exposed surface of said substrate; said emollient being distributed over at least a major portion of said exposed surface.

4,513,052

HEAT-SENSITIVE RECORDING MATERIAL

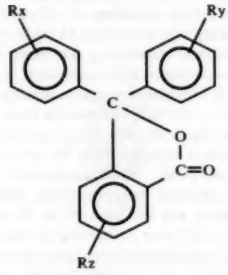
Keishi Kubo, Yokohama, and Eiichi Kawamura, Numazu, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 337,338, Jan. 6, 1982, abandoned. This application Nov. 16, 1983, Ser. No. 552,847
Claims priority, application Japan, Jan. 16, 1981, 56-5292
Int. Cl.[3] B05D 3/06
U.S. Cl. 428—219 8 Claims

1. A heat-sensitive recording material comprising a support and a heat-sensitive, color-forming layer formed on said support, said color-forming layer comprising

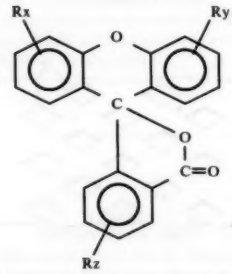
(1) 10 to 20 weight % of a colorless or pale leuco dye selected from the group consisting of

(A) triphenylmethane dyes of the formula:



wherein Rx, Ry and Rz are each hydrogen, hydroxyl, halogen, alkyl, nitro, amino, dialkylamino, monoalkylamino or aryl;

(B) fluoran dyes of the formula:



wherein Rx, Ry and Rz have the same meanings as defined above;

(C) fluoran dyes selected from the group consisting of

3-cyclohexylamino-6-chlorofluoran,

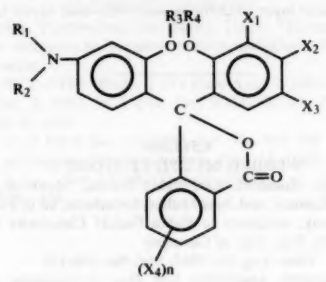
3-(N,N-diethylamino)-5-methyl-7-(N,N-dibenzylamino)fluoran,

3-pyrrolidino-6-methyl-7-anilinofluoran,

2-{N-(3'-trifluoromethylphenyl)amino}-6-diethylaminofluoran, and

2-{3,6-bis(diethylamino)-9-(o-chloroanilino)}xanthyl benzoic acid lactam;

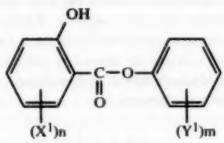
(D) lactone compounds of the formula:



wherein R_1 and R_2 are each hydrogen, lower alkyl, substituted or non-substituted aralkyl, substituted or non-substituted phenyl, cyanoethyl or β-halogenated ethyl, or R_1 and R_2, bonded together, are $-CH_2)_4$, $-CH_2)_5$ or $-CH_2)_2O-CH_2)_2$, R_3 and R_4 are each hydrogen, alkyl or phenyl, one of R_3 and R_4 being hydrogen, X_1, X_2 and X_3 are each hydrogen, lower alkyl, lower alkoxy, halogen, halogenated methyl, amino or substituted amino, X_4 is hydrogen, halogen, lower alkyl or lower alkoxy, and n is an integer of from 0 to 4,

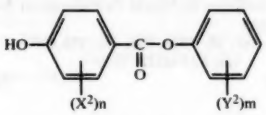
(2) 40 to 60 weight % of an acidic material capable of developing color in said leuco dye when said color-forming layer is heated to a developing temperature, wherein said acidic material is selected from the group consisting of phenolic compounds different from the compounds of the formulas (I), (II) and (III) set forth below, and

(3) 0.1 to 5.0 parts by weight, per 1 part by weight of said leuco dye, of at least one development-enhancing compound of the formula (I), (II) or (III):



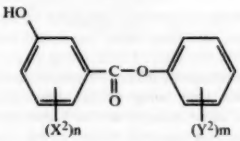
(I)

wherein X^1 is hydrogen or halogen; Y^1 is alkyl, alkoxy, halogen, benzyl, hydroxyl, carboxyl or allyl; m and n are integers in the range of from 1 to 3; and X^1 and Y^1 can be either identical or different from each other when m or n is an integer of 2 or more;



(II)

wherein X^2 is hydrogen or halogen; Y^2 is hydrogen, alkyl, alkoxy, halogen, benzyl, hydroxyl, carboxyl or allyl; m and n are integers in the range of from 1 to 3; and X^2 and Y^2 can be either identical or different from each other when m or n is an integer of 2 or more; and



(III)

wherein X^2, Y^2, n and m have the same meanings as defined above.

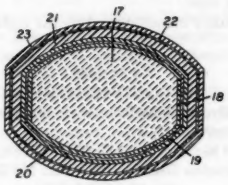
4,513,053
ENCAPSULATED PHASE CHANGE THERMAL ENERGY STORAGE MATERIALS AND PROCESS

Johnson C. H. Chen, and John L. Eichelberger, both of King of Prussia, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 504,029, Jun. 13, 1983, , which is a continuation-in-part of Ser. No. 466,802, Feb. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 145,228, Apr. 30, 1980, abandoned. This application May 14, 1984, Ser. No. 609,672

Int. Cl.[3] **B32D** *3/26, 5/18;* **F24D** *5/10, 19/02*

U.S. Cl. 428—221 **54 Claims**



1. A concrete or gypsum building construction component having dispersed within the component less than about 75% by weight of a thermal energy storage composite product capable of incorporation within rigid building construction components without causing fracture or damage to the components or product after the product undergoes repeated thermal change cycles, said product comprising:

(a) an outer shell member having a longest dimension of from about ⅛ inch to about 1 inch and having interior surfaces defining an internal cavity that is adapted to permanently encase a thermal energy storage phase-change composition, said shell being comprised of at least one seamless layer of a wall-forming material that is substantially impermeable to and non-reactive with said phase-change composition or water, the total volume of the wall-forming material being from about 5% to 30% of the volume of said cavity; and

(b) a thermal energy storage phase-change composition permanently disposed within the cavity of the shell, said phase-change composition being capable of existing in solid form, a melted liquid form, or a transition state that includes both the liquid and the solid forms, the composition being present in a quantity such that the total volume of composition whether in the solid form, the liquid form, or the transition state does not exceed the volume of the cavity.

4,513,054
MAGNETIC RECORDING MEDIUM

Tatsuji Kitamoto, and Goro Akashi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 375,683, May 6, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 585,020

Claims priority, application Japan, May 7, 1981, 56-67641

Int. Cl.[3] **H01F** *10/02*

U.S. Cl. 428—329 **15 Claims**

1. A magnetic recording medium comprising a non-magnetic support and two or more magnetic recording layers superposed thereon in which ferromagnetic particles are dispersed in a binder, characterized in that the ferromagnetic particles of the outermost magnetic layer are given a main magnetic anisotropy by a magnetic annealing treatment and the direction of the magnetic anisotropy is vertical to the recording surface, the ferromagnetic particles of the outermost layer being ferrites, Fe-Co alloys and Fe-Ni alloys, and also being oval or cubic particles having a size of at most two microns and a length/width ratio of at most 2.

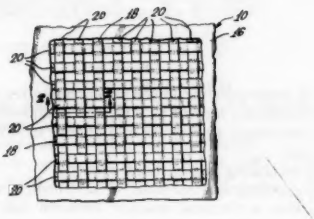
4,513,055
CONTROLLED THERMAL EXPANSION COMPOSITE AND PRINTED CIRCUIT BOARD EMBODYING SAME

Joseph D. Leibowitz, Culver City, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 30, 1981, Ser. No. 325,810

Int. Cl.[3] **B32B** *7/00;* **D03D** *3/00;* **H01B** *17/54*

U.S. Cl. 428—245 **4 Claims**



1. A composite comprising:

a resin matrix,

a woven thermal expansion coefficient control fabric embedded in said resin matrix including a first group of generally parallel first and second yarns and a second group of generally parallel first and second yarns extending transverse to the yarns of said first group,

said first yarns having a positive coefficient of thermal expansion, and

said second yarns having a negative coefficient of thermal expansion.

4,513,056
CELLULOSIC MATERIALS RENDERED TRANSPARENT

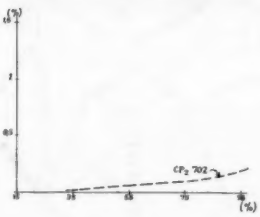
Michel Vernois, Courbevoie, and Jean-Paul Duboeuf, Charavines, both of France, assignors to Arjomari-Prioux, Paris, France

Filed Mar. 23, 1983, Ser. No. 478,050

Claims priority, application France, Mar. 25, 1982, 82 05124

Int. Cl.[3] **B32B** *23/10, 27/08*

U.S. Cl. 428—264 **13 Claims**



1. A transparentized paper comprising a cellulosic support containing cellulosic materials impregnated with a transparentizing amount of a transparentizing composition containing a ketone-aldehyde transparentization resin; a thermal cross-linking aminoplast or modified or modified alkyd resin; a solvent system, a plasticizer and wherein at least part of the solvent system is retained in the transparentized paper after the aminoplast or modified alkyd resin has been heat cross-linked.

4,513,057

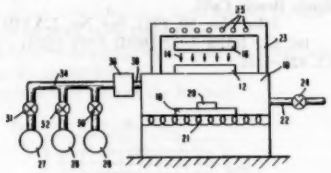
PROCESS FOR FORMING SULFIDE LAYERS

John W. Peters, Malibu, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 387,086, Jun. 10, 1982, Pat. No. 4,447,469. This application Jan. 23, 1984, Ser. No. 573,267

Int. Cl.³ H01L *21/18*

U.S. Cl. 428—336 **5 Claims**



1. A semiconductor device having optimized electrical interface properties, formed by a process comprising the steps of:

(a) providing a substrate of a chosen semiconductor material;

(b) generating neutral sulfur atoms;

(c) exposing said substrate to said neutral sulfur atoms to cause a chemical reaction between said neutral sulfur atoms and the surface of said substrate to form a first layer of a native sulfide of said chosen semiconductor material, said native sulfide being formed in a manner which eliminates damage to said substrate due to exposure to charged species, high energy radiation, or elevated temperatures to thereby enhance the electrical properties in said native sulfide layer and at said surface of said substrate; and

(d) forming a second layer of a chosen dielectric passivation material on the surface of said first layer of said native sulfide, to form a native sulfide/insulator composite, whereby the interface of said substrate with said native sulfide/insulator composite has said optimized electrical interface properties.

4,513,058

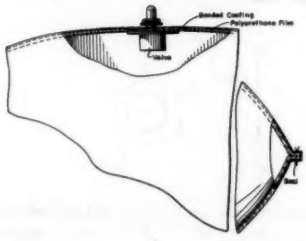
IMPACT RESISTANT HIGH AIR RETENTION BLADDERS

Robin A. Martin, Park Ridge, Ill., assignor to Wilson Sporting Goods Co., River Grove, Ill.

Filed Apr. 17, 1984, Ser. No. 601,297

Int. Cl.³ B05D *3/02*; B32B *27/40*; A63B *41/00*

U.S. Cl. 428—336 **10 Claims**



7. The method of manufacturing bladders for footballs or the like, comprising:

(a) applying a thin layer of a coating solution to one side of a polyurethane film capable of being formed into inflatible bladders, said film having a thickness of from 3 to 12 mils, said solution consisting essentially of a coating resin comprising a copolymer of vinylidine chloride and vinyl chloride dissolved in an organic carrier solvent which does not dissolve or react with the polyurethane film, said coating solution also containing from 5 to 15% by weight of an organic attack solvent miscible with said carrier solvent and which is capable of dissolving the polyurethane of said film, said resin being present in a coating concentration;

(b) rapidly evaporating the solvent from said applied coating solution;

(c) optionally repeating said applying and evaporating steps, if required, the resulting dried coating comprising a resin layer effectively fused with said polyurethane film and having a thickness of from 0.3 to 1.2 mils; and

(d) forming said coated film into inflatible bladders with said coated layers on the outside thereof, whereby high air retention polyurethane bladders are provided which resist impact delamination.

9. The method of claim **7** in which said film has a thickness of from 3 to 8 mils and said dried coating has a thickness of from 0.3 to 0.8 mils.

10. The bladders manufactured by the method of claim **9**.

4,513,059

RELEASE COATING COMPOSITION

Winifred C. Dabroski, East Brunswick, N.J., assignor to Permacel, New Brunswick, N.J.

Continuation of Ser. No. 345,127, Feb. 2, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 564,762

Int. Cl.³ C09J *7/02*

U.S. Cl. 428—355 **7 Claims**

1. A method for the production of pressure sensitive adhesive paper tape comprising the steps of:

(a) mixing in aqueous solution a water-based film-forming polymer and a perfluorinated ester polymer, thereby forming a water-based backsize release coating composition, said composition comprising an aqueous mixture of

(i) a water-based film-forming polymer and

(ii) a perfluorinated ester polymer containing from about 30 to about 50 percent fluorine, said perfluorinated ester polymer being present in an amount of from about 0.5 to about 3.0 percent, dry weight of perfluorinated ester polymer per dry weight of water-based film-forming polymer;

(b) impregnating a paper tape backing with a solvent-based or latex-based saturant to improve internal properties of the backing;

(c) coating the backing on the backside surface with the release coating composition;

(d) drying and fluxing the coated backing at a temperature of from about 250° to 300° F.; and

(e) coating the backing on the side surface opposite to the backside with a pressure sensitive adhesive.

4,513,060

CHLOROSULFONATED POLYETHYLENE COATING COMPOSITION

Joseph A. Vasta, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 8, 1984, Ser. No. 578,031

Int. Cl.³ C08L *23/34*

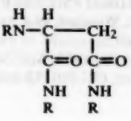
U.S. Cl. 428—416 **13 Claims**

1. A coating composition comprising 10–80% by weight of binder and 20–90% by weight of an organic solvent; wherein the binder consists essentially of about

(1) 40–85% by weight, based on the weight of the binder, of a chlorosulfonated polyethylene having a weight average molecular weight of about 75,000 to 300,000 determined by gel permeation chromatography and having a chlorine content of 20 to 50% by weight and a sulfur content of 0.7 to 2.0% by weight;

(2) 9–44% by weight, based on the weight of the binder, of an epoxy resin;

(3) 3–20% by weight, based on the weight of the binder, of a polyamine curing agent of the formula



where R is R^1NH_2 and R^1 is an aliphatic or cycloaliphatic radical; and

(4) 0.1–3% by weight, based on the weight of the binder, of a bicyclic amidine.

12. A substrate coated with a cured layer of the composition of claim 1.

4,513,061

PRIMER COMPOSITION

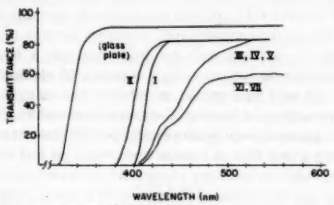
Fumio Kawakubo; Toshifumi Hirose; Tadashi Minokami, all of Kobe; Miyako Hosaka, Miki, and Katsuhiko Isayama, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 228,953, Jan. 27, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,291

Claims priority, application Japan, Jan. 29, 1980, 55-9511

Int. Cl.³ C08F *11/04;* **C08C** *9/18*

U.S. Cl. 428—429 **16 Claims**



1. In a coated glass surface consisting essentially of a primer coating directly on top of a glass surface and a sealant overcoating directly on top of said primer coating, wherein said sealant is a curable composition selected from the group consisting of modified silicon, urethane and polysulfide; the improvement consisting of said primer coating comprising 50 to 90 weight percent film forming substance, 0.5 to 35 weight percent ultraviolet light absorbing substance, and 0 to at least 0.1 weight percent pigment and/or dye, and said primer coating being formable into a film which substantially shields light have a wavelength of 380 nm or less and which is substantially transparent at other wavelengths with at least a transmission factor of at least 5% at the other wavelengths; whereby said primer coating does not substantially effect chemically said sealant coating, and whereby the period of adherence of said sealant onto said glass surface without deterioration is substantially lengthened.

4,513,062

CERAMIC BODY HAVING A METALLIZED LAYER

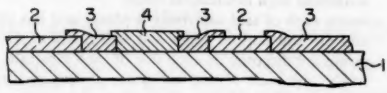
Go Suzuki, Nagoya, and Kazuo Michishita, Fujiyoshida, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 261,792, May 8, 1981, abandoned, which is a continuation of Ser. No. 48,455, Jun. 14, 1979, abandoned. This application Mar. 14, 1984, Ser. No. 589,540

Int. Cl.³ B22F *7/04, 7/08*

U.S. Cl. 428—565 **2 Claims**

1. A ceramic body having a printed-metallized layer which comprises a ceramic substrate of insulating material and at least one printed-metallized layer co-fired on the substrate to be integrated, the composition of the printed-metallized layer comprising 100 parts by weight of one or more of tungsten, molybdenum and tungsten carbide and one metal or metal mixture selected from the following groups (amounts being based on the total amount of tungsten, molybdenum and/or tungsten carbide):



0.5 to 25 parts by weight niobium,

0.5 to 10 parts by weight yttrium,

0.5 to 25 parts by weight niobium plus yttrium,

0.05 to 3 parts by weight nickel.

4,513,063

COATED RUBBER CORD

Takahiro Hashi, and Saeko Hashi, both of 1-1-9, Kasuya, Setagaya-ku, Tokyo, Japan (105)

Filed Jan. 7, 1983, Ser. No. 456,496

Claims priority, application Japan, Oct. 16, 1982, 57-181933

Int. Cl.³ B32B *15/00;* **D02G** *3/00;* **D04C** *1/02, 1/00*

U.S. Cl. 428—377 **13 Claims**

1. A coated rubber cord comprising a core member which consists of at least one rubber line coated with a woven cover material in the texture of which at least one discrete elongated rubber string is mixedly and spirally woven at substantially a constant pitch whereby to be reduced diametrically on elongation of the rubber cord and to maintain the woven cover material in a fixed position in relation to the core member no matter how the rubber cord may be stretched or allowed to contract so that provision of the woven cover material may not reduce the durability of the coated rubber cord.

4,513,064

PACKAGE FOR RUGGED ELECTRONICS

Ira R. Marcus, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1982, Ser. No. 450,617

Int. Cl.³ H01K *7/18;* **H01R** *9/09*

U.S. Cl. 428—582 **6 Claims**

1. An Electronic module for an ordnance projectile for utilization in environments wherein the substrate module would be subject to very high mechanical stress, comprising:

at least three substrates having electronic components thereon, each of said substrates having first and second

interconnecting tab means extending therefrom, each of which tab means interlocks with complementary tab means interlocks with complementary tab means extending from the substrate adjacent said tab means to form a module of relatively high mechanical strength in order to withstand high mechanical stress;

wherein each of said substrates is planar and has two sides and top and bottom edges and said first and second tab means are disposed on each side of each substrate, respectively; and each of said substrates are tapered inwardly toward the top such that the bottom edge of the substrate is longer than the top edge;

wherein said interconnecting tab means mechanically and electrically directly interconnect said substrate to the tab means on a similar adjacent substrate;

wherein said electrically interconnecting tabs are soldered to complementary electrically interconnecting tabs on a similar substrate so as to secure the the electrical conduction path across these complementary conducting traces; and wherein said mechanically interconnecting tab means interlock along a surface plane that is perpendicular to the direction of flight of said ordnance projectile wherein said direction of flight is also parallel to the direction in which primary mechanical stress occurs, while the electrically interconnecting tabs interlock along a surface plane that is parallel to said primary mechanical stress such that the mechanically interconnecting tabs receive most of the mechanical stress.

4,513,065

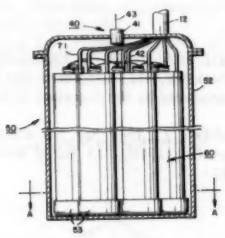
HYDROGEN GENERATOR

Otto J. Adlhart, Newark, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Division of Ser. No. 399,057, Jul. 16, 1982, Pat. No. 4,463,063. This application May 16, 1984, Ser. No. 610,740

Int. Cl.³ H01N *8/18*

U.S. Cl. 429—19 **6 Claims**



1. A hydrogen generator of the type which relies at least partially on the process of anodic corrosion to generate hydrogen comprising:

(a) a drum means,

(b) a plurality of cartridges in the drum means, each cartridge having a container with an aqueous electrolyte therein, an anodic material mounted in the container having a relatively high ratio of surface area to volume, a cooperating cathode mounted in the container closely spaced from the surface of the anodic material and means for removing hydrogen from the cartridge,

(c) means for feeding the hydrogen removed from the cartridges out of the generator, and

(d) means for activating the cartridges allowing electric current to flow to produce hydrogen.

4,513,066

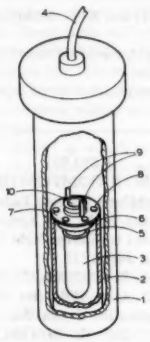
THIN-FILM, HIGH PRESSURE FUEL CELL

Donald R. Simon, East Windsor, N.J., assignor to Prutec Limited, London, England

Filed Mar. 30, 1983, Ser. No. 480,229

Int. Cl.³ H01M *8/08*

U.S. Cl. 429—42 **6 Claims**



1. A fuel cell comprising at least one oxygen electrode and at least one hydrogen electrode, the said electrodes being composed of, respectively, oxygen gas and hydrogen gas separated by thin-film porous membranes, wherein there is located between the oxygen gas and the hydrogen gas a hydrophilic porous membrane wetted with a solution of electrolyte, and between the said hydrophilic membrane and oxygen gas and also between the said hydrophilic membrane and hydrogen gas there are located two hydrophobic porous membranes each plated with a thin film of a noble metal catalyst and each being associated with an adjacent electrically-conducting metal element, the said thin films of catalyst each having a thickness of 200 to 1000 Å, and the said arrangement of gases, membranes, electrolyte, catalyst films and conducting elements being subjected to a gas pressure of 500 to 20,000 psi whereby the oxygen and hydrogen gases go into solution in the electrolyte and electric current generated by the reaction of the gases at the surface of the catalyst is taken from the electrically-conducting elements.

4,513,067

INORGANIC NON-AQUEOUS CELL

Han C. Kuo, Burlington; Donald L. Foster, Somerville; Carl R. Schlaikjer, Winchester; Mysore L. Gopikanth, Burlington, and Arabinda N. Dey, Needham, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 30, 1983, Ser. No. 509,691

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—101 **20 Claims**

1. A non-aqueous, electrochemical cell comprising an anode comprised of an alkali or alkaline earth metal, an inorganic electrolyte comprised of SO_2 having dissolved therein an alkali or alkaline earth metal halide salt containing aluminum, tantalum, niobium or antimony whereby said SO_2 per se is not a cathode active material characterized in that said cell contains a cathode comprised of a conductive carbonaceous material having an apparent bulk density in excess of 80 gm/liter.

4,513,068
AUXILIARY BATTERY CHARGING TERMINAL

Harold Field, Plantation, and Robert E. Richter, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

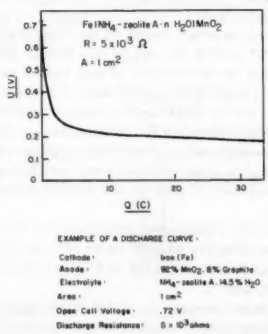
Filed Oct. 20, 1983, Ser. No. 543,697
Int. Cl.³ H01M 2/26
U.S. Cl. 429—121 8 Claims

1. An improved rechargeable battery cell for selectively, electrically engaging charging circuitry comprising:
a cathode disk having a periphery and a projecting tip means for selectively, electrically engaging charging circuitry;
an anode jacket mechanically captivating said cathode disk periphery about a battery cell; and
an electrically insulating seal ring therebetween,
whereby said projecting tip electrically engages said charging circuitry, whereas said charging circuitry is not engaged in the absence of said projecting tip and
whereby said tip is axially constrained against lateral displacement within a battery charging receptacle.

4,513,069
GALVANIC CELL COMPRISING SOLID PROTON CONDUCTOR AS ELECTROLYTE

Klaus-Dieter Kreuer, Böblingen; Werner Weppner, and Albrecht Rabenau, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,954
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127820
Int. Cl.³ H01M 6/18
U.S. Cl. 429—192 16 Claims



EXAMPLE OF A DISCHARGE CURVE

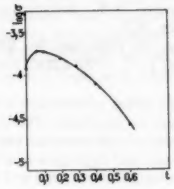
Cathode:	Iron (Fe)
Anode:	90% MnO_2, 6% Graphite
Electrolyte:	NH_4 - zeolite A, 14.5% H_2O
Area:	1 cm^2
Open Cell Voltage:	.72 V
Discharge Resistance:	5×10^3 ohms

1. In a galvanic cell having a metal oxide or metal sulfide electrode, a metal electrode, and between them an electrolyte, the improvement wherein said electrolyte is a solid proton conductor comprising zeolites having proton-containing cations and having six-membered rings and/or larger rings as secondary structural groups of the zeolitic structure, and having in the crystal lattice passages of said zeolites, a phase which promoter proton transport.

4,513,070
VITREOUS MATERIALS WITH IONIC CONDUCTIVITY, THE PREPARATION OF SAME AND THE ELECTROCHEMICAL APPLICATIONS THEREOF

Brigitte Carette, Paris; Ali Kone, Abidjan; Jean-Louis Souquet, Grenoble; Michel Ribes, Clapiers, and Maurice Maurin, Montpellier, all of France, assignors to Centre National de la Recherche Scientifique, France

Filed Feb. 8, 1983, Ser. No. 465,030
Claims priority, application France, Feb. 9, 1982, 82 02083
Int. Cl.³ H01M 6/18; C03C 3/04, 3/12, 3/16
U.S. Cl. 429—193 13 Claims



1. A doped vitreous material with a network former system, network modifier system, and a doping system having the general formula I:

$$xFo—yM—zD \quad (I)$$

in which:
Fo represents the network former system and comprises a compound of the formula A_aR_b or several compounds of said formula different from each other, A being selected from Si, Ge, P, S, B, Nb, As, V, Cr, Mo and R from O,S, Se, A and R further corresponding to chemically compatible elements,
M represents the network modifier system having the formula N_mR_c, N being selected from Li, Na, K and Ag and R having, independently, one of the meanings given above for the network former elements,
a b, m and c represent the indices corresponding to the stoichiometry of the constituents in a given group and,
x, y and z, different from 0 and whose sum equals to 1, represent the indices corresponding to the overall molar fractions respectively of the compound or compounds forming the former system, the modifier system and the doping salt of the material, the values of these indices being compatible with the vitreous range of a given material,
d represents the doping system,
wherein D is formed of at least two doping salts, the salt having the highest dissociation constant being partially substituted by an another salt or other salts whose dissociation constant are lower, in an amount giving an increase of conductivity, said doping system having formula N_nY_p, the meaning of N in the group NY, being for each salt identical to that of N in the group NR, Y having in each of these salts different meanings selected from I, Br, Cl, F, ClO_4, CF_3, SO_3, SCN, SO_4, and n and p represent the indices corresponding to the stoichiometry of the constituents in a given group and
the elements A, R and Y being such that the materials have a conductivity of at least $10^{-4}\Omega^{-1}cm^{-1}$, at room temperature when N represents Ag, and a conductivity of at least $10^{-8}\Omega^{-1}cm^{-1}$ at room temperature when N represents an alkaline metal, and with the proviso that Fo does not

represent a B_2O_3 or B_2O_3-SiO_2 former system and M a Li_2O modifier system when D is a composite $(LiCl)_2$ and Li_2SO_4 salt.

9. A process for preparing the materials according to claim 1, two or more dopes are dissolved simultaneously in a vitreous material formed of a network former compound and a network modifier compound, in proportions compatible with the vitreous range of the glass considered, while operating sheltered from the air, at a temperature, of the order of 700° to 800° C., sufficient for obtaining fusion of the glass and the dissolution of the doping salts.

11. Solid electrolytes, characterized in that they comprise a material according to claim 1.

12. Electrochemical devices, comprising an electrolyte according to claim 11.

4,513,071

ERASABLE INFORMATION RECORDING PROCESS USING CO-CRYSTALLINE DYE COMPLEXES

William Mey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,912

Int. Cl.³ G03C *1/72, 7/00;* **G03G** *5/026, 13/16*

U.S. Cl. 430—19 **11 Claims**

1. A process for recording information visibly, which comprises exposing a layer of aggregate dye complex to actinic radiation that deaggregates said complex and produces a color change in exposed areas, said aggregate dye complex comprising a co-crystalline complex of polymer and dye or of dye and dye.

3. A process according to claim 1, further comprising:

erasing recorded information by softening at least selected deaggregated areas sufficiently to allow reaggregation.

4,513,072

DUAL LAYER ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING A LAYER OF SELENIUM, ARSENIC AND HALOGEN, AND THEREABOVE A LAYER OF SELENIUM AND TELLURIUM

Hartmut Dülken; Karlheinz Kassel, both of Warstein; Wolfgang Möws, Welver-Borgeln, and Hubert Walsdorfer, Warstein, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,466

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135229

Int. Cl.³ G03G *5/08*

U.S. Cl. 430—57 **10 Claims**

1. An electrophotographic recording material consisting of a conductive substrate, a first photoconductive selenium layer comprising 0.1 to 5 percent by weight arsenic and a halogen disposed on said substrate, and a second photoconductive selenium layer comprising 1 to 40 weight percent tellurium and arsenic in an amount of up to 1 weight percent disposed on said first photoconductive layer.

4,513,073

LAYERED PHOTOCONDUCTIVE ELEMENT

Frank R. Jeffrey, III, and James R. Shirck, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 18, 1983, Ser. No. 524,525

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—65 **11 Claims**

1. In a photoconductive element comprising an electrically conductive, supporting substrate and a photoconductive layer carried by said substrate wherein a blocking layer means is carried adjacent at least one major surface of said photoconductor layer to suppress the flow of charge carriers attracted toward the photoconductive layer as a result of any surface charge applied to said element, wherein the improvement comprises a space charge layer interposed between said blocking layer means and said photoconductive layer, said space charge layer comprising a semiconductive material selected from the group consisting of n-type and p-type semiconductor materials, the space charge layer between said photoconductive layer and said blocking layer being selected so that upon charging said photoconductive element the electrical field at the interface between said space charge layer and said photoconductor is higher than the electric field at the interface between said space charge layer and said blocking layer.

4,513,074

STABLE CONDUCTIVE DEVELOPER COMPOSITIONS

Robert J. Nash, and Kent A. Randall, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 6, 1983, Ser. No. 501,666

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—106.6 **24 Claims**

1. An improved stable two-component conductive developer having a toner composition consisting essentially of (1) first resin particles of styrene methacrylate copolymers, grafted with or containing a low molecular weight wax composition, (2) second resin particles of a styrene, acrylate, acrylonitrile terpolymer, (3) pigment particles, (4) colloidal silica additive particles, (5) fatty acid metal salt additive particles, and (6) uncoated ferrite carrier particles.

4,513,075

DEVELOPER MATERIALS FOR ELECTROSTATIC IMAGES

Toshiaki Narusawa, Sagamihara; Seiji Okada, Kawasaki; Kiyohide Muramatsu, Tokyo; Teruo Yagishita, Kawasaki, and Hirofumi Okuyama, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 62,311, Jul. 30, 1979,. This application Nov. 12, 1981, Ser. No. 320,609

Claims priority, application Japan, Aug. 1, 1978, 53-93110; Mar. 26, 1979, 54-34221

Int. Cl.³ G03G *9/10*

U.S. Cl. 430—108 **14 Claims**

1. A developer material for electrostatic images comprising a mixture of a coated carrier and toner particles, wherein:

(1) said carrier comprises iron core beads coated with a coating resin comprising at least one butadiene homopolymer of a molecular weight of from 10,000 to 100,000, each said homopolymer being 1,2-polybutadiene or cyclized cis-1,4-polybutadiene, or a mixture of at least one of said homopolymers and a styrene/butadiene copolymer of a molecular weight of from 10,000 to 100,000, said mixture containing an effective amount of at least 7.5% by weight, based on the weight of said mixture, of butadiene in polymerized form; and

(2) said toner comprises, based on the weight of said toner:

(A) from 85 to 95% by weight of a binder resin comprising, based on the weight of said binder resin, at least 50% by weight of an epoxy resin of a molecular weight of from 900 to 8,000 and an epoxy equivalent in the range from 450 to 5,500, and an effective amount up to 50% by weight of a styrene/alkyl methacrylate copolymer, the alkyl group of said copolymer having from 1 to 4 carbon atoms, of a molecular weight of from 10,000 to 100,000;

(B) a colorant comprising, based on the weight of said toner, an effective amount up to 10% by weight of fine carbon and from about 0.5 to 8% by weight of a nigrosine dye, and

(C) an effective amount up to 8% by weight of a charge controlling agent, based on the weight of said toner, comprising a quaternary ammonium alkyl sulfonate, this alkyl group having from 4 to 20 carbon atoms, di-(polyhydroxy ethoxy ethyl)octadecyl amine, or a polyamine; and

the ratio of the total surface area of said carrier to the

total projection area of said toner particles being in the range of from 1:0.5 to 1:2.0.

4,513,076

ELECTRON BEAM SENSITIVE RESIST

David F. Lewis, Monroe, Conn., assignor to GAF Corporation, Wayne, N.J.

Filed May 24, 1983, Ser. No. 497,527
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—270 **10 Claims**

1. An improved high sensitivity electron beam resist polymer which is a metal complex, wherein the metal is selected from a group consisting of lead, rhodium, calcium or thallium, wherein the lead, calcium or thallium complex is a salt formed by an excess metal ion and carboxyl ion and the rhodium complex is a metal ion and an olifin group in a one to one relationship of the mixed half-ester reaction product of an alkyl vinyl ether-maleic anhydride copolymer with a terminally unsaturated alcohol and an N-hydroxyalkyl amide.

4,513,077

ELECTRON BEAM OR X-RAY REACTIVE IMAGE-FORMABLE RESINOUS COMPOSITION

Asao Isobe; Daisuke Makino, both of Hitachi, and Hiroshi Shiraishi, Kokubunji, all of Japan, assignors to Hitachi Chemical Company, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,634
Claims priority, application Japan, Jun. 25, 1982, 57-110252
Int. Cl.³ G03C *1/495*
U.S. Cl. 430—270 **18 Claims**

1. An electron beam or x-ray reactive image-formable resinous composition comprising a poly(olefinsulfone) and a matrix polymer, said matrix polymer being a novolac phenol resin obtained from the reaction of:

(1) a mixture consisting essentially of (i) at least 90% by weight of m-cresol and p-cresol as main components wherein the molar ratio of m-cresol/p-cresol is within the range of from 40/60 to 55/45 and (ii) from 0 to 10% of at least one phenolic compound selected from the group consisting of phenol and a derivative of phenol other than m-cresol and p-cresol; and

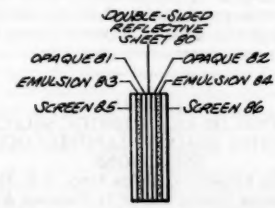
(2) formaldehyde, wherein the molar ratio of formaldehyde to the amount of said mixture is within the range of from 5/10 to 8/10.

4,513,078

FILM-BASED DUAL ENERGY RADIOGRAPHY

John M. Sandrik, and Norbert J. Pelc, both of Wauwatosa, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,786
Int. Cl.³ G03C *1/84, 1/92*; G03B *41/16, 11/00*
U.S. Cl. 430—496 **12 Claims**



1. A film package for forming on one radiographic film an image of an anatomical region corresponding to an image made by exposing the region to one X-ray energy spectral band and for forming on another film an image of the same region corresponding to one made by exposing the region to another X-ray energy spectral band where both images are formed simultaneously by exposing the region to a polyenergetic X-ray beam having a broad energy spectrum, and there are first and second parallel X-ray intensifying screens arranged in the path of the beam emergent from the region which are excited to luminescence by the X-ray energy spectra which they absorb, said film package comprising:

first and second radiographic films having their planar image recording surfaces in parallelism with each other for being disposed between said intensifying screens and in contact with said first and second screens, respectively, so the emergent beam will be incident to the first screen,

a light-opaque sheet inserted between said films for transmitting to said second film and second screen some of the x-radiation that is not absorbed by said first screen and first film and for preventing light from one intensifying screen from exposing the film in contact with the other screen, and

an X-ray impervious device for being interposed in the emergent beam to produce congruent images of said device on both films when the films are parallel to each other during an exposure, said images constituting reference marks for relating picture elements on one film to corresponding picture elements on the other film when the films are separated from each other for readout.

4,513,079

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Kei Sakanoue, and Kozo Aoki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1983, Ser. No. 542,316
Claims priority, application Japan, Oct. 14, 1982, 57-180138
Int. Cl.³ G03C *1/46*
U.S. Cl. 430—502 **6 Claims**

1. A silver halide color photographic material comprising:

a support having coated thereon;

at least one layer of silver halide emulsion containing a phenolic cyan coupler which is substituted by an acylamino group at the 5-position and by an ureido group at the 2-position; and

at least one layer, adjacent to said coupler-containing layer, containing a fine grain silver halide emulsion.

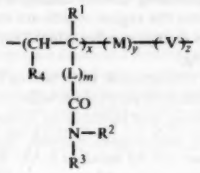
4,513,080

PHOTOGRAPHIC SILVER HALIDE CONTAINING RECORDING MATERIAL WITH CROSSLINKED MICROGEL PARTICLES

Günter Helling, Odenthal, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 488,362, Apr. 25, 1983, abandoned. This application Sep. 10, 1984, Ser. No. 648,616
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 32170203
Int. Cl.³ G03C *1/72*
U.S. Cl. 430—537 **2 Claims**

1. A photographic recording material comprising a layer support, one or more gelatin containing layers in which at least one layer is a light sensitive silver halide emulsion layer and the binder of at least one of the gelatin-containing layers consisting of at least 20% by weight of latices of cross-linked microgel particle-shaped water insoluble copolymer, the copolymer being represented by the following formula:



wherein

R^1 denotes a hydrogen atom or an alkyl group having 1 to 6 carbon atoms,

R^2 denotes a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 6 carbon atoms, an aralkyl group, a substituted or unsubstituted aryl group, a 5-membered or 6-membered substituted or unsubstituted heterocyclic ring containing oxygen, sulfur or nitrogen,

R^3 has the meaning of R^2, and R^2 and R^3 may be identical or different, with the proviso that R^2 or R^3 must not be a residue of an agent which is active in the photographic layer,

R^4 denotes a hydrogen atom or the group $-COOR^1$,

L denotes an alkylene residue having 1 to 6 carbon atoms, an arylene residue having 6 to 10 carbon atoms, an arylenealkylene residue having 7 to 11 carbon atoms or a group $-COOR^5$ or $-CONHR^5$ wherein R^5 denotes one of the bivalent residues mentioned above,

M denotes a residue of polymerized monomers containing an ethylenically unsaturated group,

V denotes a residue of a polymerized monomer containing at least two ethylenically unsaturated groups,

m is 0 or 1,

x represents at least 10% by weight,

y represents 89.5 to 0% by weight,

z represents 10 to 0.5% by weight, and the sum of proportions by weight x, y and z should in each case be 100%

and wherein the copolymer particles have a diameter of from 20 nm to 1 μm.

4,513,081

SILVER HALIDE PHOTOGRAPHIC EMULSION

Masaki Okazaki; Osami Tanabe; Satoshi Nagaoka; Yuji Mihara; Keizo Kimura, and Makoto Umemoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed May 21, 1984, Ser. No. 612,497

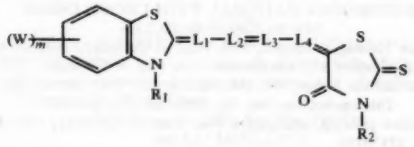
Claims priority, application Japan, May 19, 1983, 58-88081

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—550 **9 Claims**

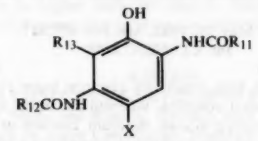
1. A silver halide photographic emulsion containing in combination at least one sensitizing dye represented by formula (I) and at least one cyan coupler represented by formula (II):

(I)



wherein W represents a halogen atom, an unsubstituted or substituted alkyl group, an unsubstituted or substituted aryl group, a hydroxyl group, an unsubstituted or substituted alkoxy group, an unsubstituted or substituted aryloxy group, an acyl group, an acyloxy group, an unsubstituted or substituted alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a carboxyl group, or an unsubstituted or substituted benzo group; L_1, L_2, L_3, and L_4 each represents an unsubstituted or substituted methine group; R_1 represents an unsubstituted or substituted alkyl group; R_2 represents an unsubstituted or substituted alkyl group, an unsubstituted or substituted aryl group or a heterocyclic group; provided that at least one of R_1 and R_2 represents a substituted alkyl group containing a sulfo group or a carboxyl group; and m represents 0, 1, or 2;

(II)



wherein R_{11} and R_{12} each represents an alkyl group, an aryl group, a heterocyclic group, an alkyloxy group, an aryloxy group, a heterocyclyloxy group, an alkylamino group, an arylamino group or a heterocyclylamino group; R_{13} represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an acyloxy group or an acylamino group; or R_{12} and R_{13} may be connected to each other to form a 5- or 6-membered ring; and X represents a group capable of being eliminated upon an oxidative coupling reaction with a developing agent.

4,513,082

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Nobuo Furutachi, and Takeshi Hirose, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 23, 1984, Ser. No. 592,995

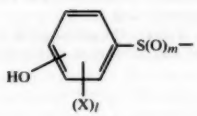
Claims priority, application Japan, Mar. 28, 1983, 57-52923

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—552 **7 Claims**

1. A silver halide color photographic light-sensitive material containing at least one coupler having a ballast group represented by the following general formula (I):

(I)



wherein X represents a halogen atom, an alkyl group, an aryl group, a heterocyclic group, a hydroxy group, an alkoxy group, an aryloxy group, an acylamino group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a ureido group, an alkoxycarbonyl group, an alkoxycarbonylamino group, a sulfonyl group, an alkylthio group, a cyano group, a nitro group or a carboxyl group, l represents an integer of 1 to 4, and m represents an integer of 1 or 2, with the proviso that when X represents a hydroxyl group, a substituent other than a hydroxy group is also present on the phenyl ring.

4,513,083

PREPARATION OF AN ANTIBIOTIC SELECTIVELY EFFECTIVE AGAINST STAPHYLOCOCCUS INFECTIONS

David S. Hodes, Cricket La., Dobbs Ferry, N.Y. 10522; Grace Leidy; Katherine Sprunt, both of 21 Glenwood Ave., Leonia, N.J. 07605, and Piper Weldy, 350 Bleeker St., New York, N.Y. 10014

Continuation-in-part of Ser. No. 364,330, Apr. 1, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,038

Int. Cl.³ C12P *21/00;* **C12N** *1/20;* **C12R** *1/01*

U.S. Cl. 435—68 **13 Claims**

1. A biologically pure culture of the microorganism *Rothia dentocariosa*, having the identifying characteristics of ATCC

31918, said culture being capable of producing the antibiotic staphylocidin, having selective antimicrobial activity against staphylococci including *S. aureus* and *S. epidermidis*, in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

4. A staphylocidin-containing product, which comprises the cell murein recovered from the fermentation product of the biologically pure culture of either of claims 1 or 2:

(a) comprising a peptidoglycan polymer having the following approximate amino acid and amino sugar contents:

Amino Acid	Contents by Weight Relative to Alanine
Asp	0.16
Thr	0.09
Ser	0.07
Glu	0.43
Gly	0.16
Ala	1.00
Val	0.16
Ile	0.09
Leu	0.20
Tyr	0.06
Phe	0.08
Lys	0.34
His	0.04
Arg.	0.10
Muramic Acid	0.47
Glucosamine	1.04; and

(b) exhibiting the following R_f values upon thin layer chromatography in an isopropanol/acetic acid/water system on silica gel G plates, after digestion with lysozymen and lysostaphin:

Fraction	R_f Value
(1)	0.66 ± 0.01 [n-acetylglucosamine = 0.65]
(2)	0.58 ± 0.01
(3)	0.59 ± 0.01
(4)	0.74 ± 0.01 [n-acetylmuramic acid = 0.73]; and

(c) having bonded thereto the narrow-spectrum antibiotic staphylocidin, which is selectively effective against staphylococci including *S. aureus* and *S. epidermidis;*

the murein forming a staphylocidin-containing extract upon treatment with a glacial acetic acid or n-butanol solvent and evaporation of the solvent from the supernate, which extract exhibits the following characteristics:

(1) a biologically active component with an R_f value of 0.98–0.99 upon thin layer chromatography in a methanol/acetic acid/phosphate-buffered saline system on a microcrystalline cellulose plate and yellow-green fluorescence in long wave ultraviolet light;

(2) a biologically active component with an R_f value of 0.04 upon thin layer chromatography in a butanol/acetic acid/phosphate-buffered saline system on a microcrystalline cellulose plate and yellow-green fluorescence in long wave ultraviolet light;

(3) a biologically active component with an R_f value of 0.04 upon thin layer chromatography in an ethyl acetate/pyridine/water system on a microcrystalline cellulose plate and yellow-green fluorescence in long wave ultraviolet light;

(4) a component with an R_f value of 0.88 upon thin layer chromatography in a methanol/acetic acid/phosphate-buffered saline system on a silica gel plate and yellow-green fluorescence in long wave ultraviolet light; and

(5) the R_f 0.98–0.99 component containing staphylocidin and exhibiting the HPLC peaks plotted in FIG. 1 of the accompanying drawings.

4,513,084

MUTANT STRAIN OF *CLOSTRIDIUM THERMOACETICUM* USEFUL FOR THE PREPARATION OF ACETIC ACID

Frederick A. Keller, Jr., Naperville; Jeffrey S. Ganoung, Brookfield, and Susan J. Luenser, LaGrange Park, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 11, 1983, Ser. No. 474,608

Int. Cl.[3] **C12P** *7/54;* **C12N** *15/00, 1/20;* **C12J** *1/00*

U.S. Cl. 435—140 **9 Claims**

1. A biologically pure culture of a mutant strain of the microorganism *C. thermoaceticum,* ATCC No. 39,289, useful for the production of acetic acid when grown in an aqueous medium containing assimilable sources of carbon, nitrogen and inorganic substances, which grows at a pH below 5.0 at a temperature of from 50° C. to 65° C. and has a specific growth rate of at least about 0.30 hr^{-1} when grown in a continuous culture at pH 7 and 58° C.

2. In a method for converting carbohydrates to acetic acid by growing *C. thermoaceticum* in an anaerobic fermentor on an aqueous medium containing assimilable sources of carbon, nitrogen and inorganic substances and separating the acetic acid from the medium, wherein the improvement comprises using a biologically pure culture of the mutant strain of *C. thermoaceticum,* ATCC No. 39,289, in a pH controlled continuous fermentation at a pH of about 5 to about 8, at a temperature of about 50° C. to about 65° C. and at a dilution rate of about 0.01 to about 0.40 per hour.

4,513,085

FUNCTIONALLY INDEPENDENT CLONING VECTORS FOR USE IN STREPTOMYCES

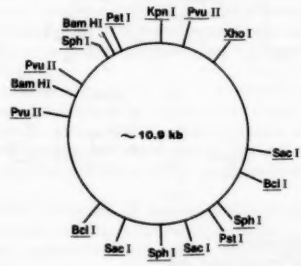
Walter M. Nakatsukasa, and James A. Mabe, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 7, 1982, Ser. No. 433,197

Int. Cl.[3] **C12N** *1/20, 15/00, 1/00;* **C07H** *15/12*

U.S. Cl. 435—253 **49 Claims**

Restriction Site Map of Plasmid pEL7



1. A functionally independent recombinant DNA cloning vector comprising:

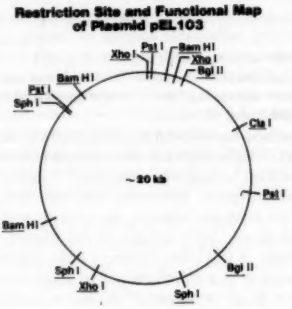
(a) a functional origin of replication-containing restriction fragment of plasmid pEL7 and

(b) one or more DNA segments that confer resistance to at least one antibiotic when transformed into a sensitive host cell, said host cell being susceptible to transformation, cell division, and culture.

4,513,086
CLONING VECTORS FOR USE IN STREPTOMYCES AND RELATED ORGANISMS

Jeffrey T. Fayerman, and Mark A. Richardson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 311,711, Oct. 15, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,082
Int. Cl.[3] **C12N** *1/00, 15/00, 1/20;* **C12P** *21/00, 21/02, 19/34;* **C07H** *21/04*
U.S. Cl. 435—317 **97 Claims**

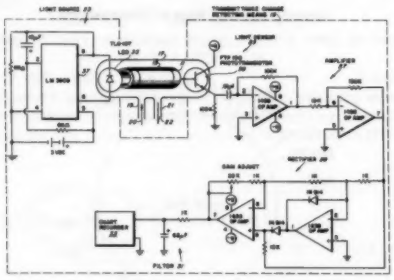


1. A recombinant DNA cloning vector comprising:
(a) a functional origin of replication-containing restriction fragment of plasmid pEL103, and
(b) one or more DNA segments that convey resistance to at least one antibiotic when transformed into a sensitive restrictionless host cell, said host cell being susceptible to transformation, cell division, and culture.

4,513,087
REVERSIBLE OPTICAL WAVEGUIDE VAPOR SENSOR

John F. Giuliani, Kensington, Md., and Henry Wohltjen, Burke, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1983, Ser. No. 462,493
Int. Cl.[3] **G01N** *21/00, 21/78*
U.S. Cl. 436—96 **21 Claims**



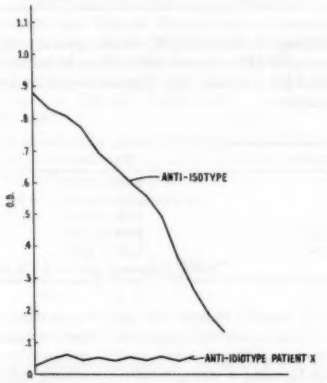
1. In combination,
an optical waveguide; and
an oxazine perchlorate dye film coated on the optical waveguide and having the property of changing from its normal color to another color when exposed to a chemical selected from the group consisting of ammonia, hydrazine, and pyridine, and returning to its original color when the chemical is removed;
whereby the optical transmittance of the waveguide varies with the color of the dye film coating.

20. A reusable method of detecting small amounts of a chemical selected from the group consisting of ammonia, hydrazine, or pyridine in a gas comprising the steps of:
transmitting light through an optical waveguide coated with an oxazine perchlorate dye film whose normal color changes to another color when exposed to the chemical and which returns to its original color when the chemical is removed;
circulating the gas having the chemical therein over the waveguide such that the chemical comes into contact with the oxazine perchlorate dye film; and
detecting changes in the optical transmittance of the waveguide caused by variation in the color of the dye film.

4,513,088
ASSAY FOR MONOCLONAL ANTIBODY AGAINST SURFACE IG OF A HUMAN B CELL TUMOR

Ronald Levy, Stanford; David G. Maloney, Palo Alto, and Kristiaan Thielemans, Stanford, all of Calif., assignors to The Board of Trustees of The Leland Stanford Junion University, Stanford, Calif.

Filed Mar. 30, 1983, Ser. No. 480,478
Int. Cl.[3] **G01N** *33/54*
U.S. Cl. 436—518 **10 Claims**



1. An immunoassay for detecting a monoclonal antibody that binds specifically to the surface IG of a human B cell tumor in a hybridoma culture medium suspected of containing the monoclonal antibody comprising:
(a) incubating a lysate of cells of the tumor with an antibody immobilized on a solid phase that binds to the surface Ig but not to the monoclonal antibody under conditions that promote binding of the surface Ig to the immobilized antibody;
(b) removing unbound lysate material from the solid phase;
(c) incubating the solid phase with the hybridoma culture medium under conditions that promote binding of any monoclonal antibody in the culture medium to immobilized antibody-surface Ig complex;
(d) removing unbound culture medium material from the solid phase;
(e) incubating the solid phase with a labeled antibody that binds to the monoclonal antibody under conditions that promote binding of the labeled antibody to immoblized antibody-surface Ig-monoclonal antibody complex;
(f) removing unbound labeled antibody from the solid phase;
(g) detecting the presence of labeled complex in the product of step (f).

4,513,089

SUPERREFRACTORY DRY RAMMING MATERIAL BASED ON ZIRCONIUM OXIDE FOR THE LINING OF INDUCTION-TYPE CRUCIBLE FURNACES

Peter Kummer, Siegburg, and Gerhard Rehfeld, Aachen, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 307,258, Sep. 30, 1981, abandoned. This application Oct. 25, 1983, Ser. No. 545,479

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037268

Int. Cl.[3] C04B *35/48*

U.S. Cl. 501—103 7 Claims

1. A superrefractory dry ramming material based on zirconium oxide for the lining of induction-type crucible furnaces consisting essentially of a zirconium oxide low in SiO_2 and conventionally stabilized with CaO, MgO, Y_2O_3, rare earths or their mixed oxides which has a particle size ranging up to 8 mm, and from 5 to 40 weight percent finely divided monoclinic, fused zirconium oxide containing less than 0.5 eight percent SiO_2 the superrefractory material having a rammed density of at least 4.3 g/cm^3.

4,513,090

CRYSTALLINE SILICA ZEOLITE-CONTAINING CATALYST

Paul E. Eberly, Jr., and William E. Winter, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 9, 1981, Ser. No. 281,860

Int. Cl.[3] B01J *29/28, 29/04*

U.S. Cl. 502—66 9 Claims

1. A catalyst comprising a physical mixture of particles of (a) a crystalline silica zeolite having uniform pore diameters, and (b) a hydrogenation component composited with a non-zeolitic alumina-containing support comprising from about 1 to about 6 weight percent amorphous silica, based on the weight of said support.

2. The catalyst of claim 1 wherein said hydrogenation component is selected from the group consisting of Group VIB metal components, Group VIII metal components and mixtures thereof.

9. The catalyst of claim 1 wherein said crystalline silica zeolite is silicalite.

4,513,091

HYDROTHERMAL ZEOLITE ACTIVATION

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 14, 1983, Ser. No. 465,987

Int. Cl.[3] B01J *29/28, 37/08*

U.S. Cl. 502—71 9 Claims

1. A method for introducing tetrahedrally bound aluminun into the structure of a high silica content crystalline zeolite having a silica to alumina ratio of at least 70:1 and a Constraint Index of 1 to 12, which method comprises:

forming a mixture of said zeolite and an alumina; and

hydrothermally treating said mixture with a dilute aqueous solution of sodium hydroxide at a temperature of about 80° C. to 370° C. and for a time effective to increase the tetrahedrally bound aluminum content of said zeolite.

3. The method described in claim 2 wherein said zeolite has a silica to alumina ratio above 500:1.

4,513,092

COMPOSITE CATALYST FOR HALOGENATION AND CONDENSATION OF ALKANES

Pochen Chu, Deptford, N.J., and Francis G. Dwyer, West Chester, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 568,153, Jan. 4, 1984,. This application Mar. 29, 1984, Ser. No. 594,583

Int. Cl.[3] B01J *29/30*

U.S. Cl. 502—71 8 Claims

1. A dual-function chlorination-condensation catalyst composition consisting essentially of (a) Deacon-type catalyst comprising cupric halide, alkaline earth halide and/or alkali metal halide, and/or rare earth metal halide and (b) crystalline aluminosilicate zeolite component having a silica to alumina ratio of at least 12 and constraint index of 1 to 12.

2. The catalyst composition of claim 1 wherein the Deacon-type catalyst comprises about 1 to 20 weight percent of the zeolite component.

3. The catalyst composition of claim 2 wherein the dual function catalyst contains 10 to 90 weight percent alumina binder.

4,513,093

IMMOBILIZATION OF VANADIA DEPOSITED ON SORBENT MATERIALS DURING TREATMENT OF CARBO-METALLIC OILS

H. Wayne Beck, Russell; James D. Carruthers, Catlettsburg; Edward B. Cornelius, Ashland; William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland; James L. Palmer, Flatwoods, and Oliver J. Zandona, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

PCT No. PCT/US81/00357, § 371 Date Mar. 30, 1981, § 102(e) Date Mar. 30, 1981, PCT Pub. No. WO82/03226, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 19, 1981, Ser. No. 277,752

Int. Cl.[3] B01J *21/16*

U.S. Cl. 502—84 29 Claims

1. A sorbent material wherein the composition of said sorbent comprises kaolin clay, a titania gel in an amount in the range of about 1 to about 8 weight percent of sorbent, and a metal additive sufficient to immobilize vanadium compounds in the presence of an oxygen containing gas at sorbent regeneration temperatures.

3. A composition of matter for use as a sorbent comprising kaolin clay, a zirconia gel in an amount of the range of about 1 to about 8 weight percent, and a metal additive in an amount sufficient to immobilize vanadium compounds in the presence of an oxygen containing gas at sorbent regeneration temperature.

6. A sorbent comprised of microspherical particles each containing a metal additive, in an amount sufficient to immobilize vanadium compounds in the presence of an oxygen containing gas at sorbent regeneration temperature, kaolin clay, a titania gel or a zirconia gel or a combination of titania gel and zirconia gel with an alumina gel, said gel material comprising about 1 to about 8 weight percent of said sorbent.

15. A composition of claims 1, 2, 3, 4, 5 or 6 wherein said metal additive to immobilize vanadium compounds comprises Mg, Ca, Sr, Ba, Sc, Y, La, Ti, Zr, Hf, Nb, Ta, Mn, Mi, In, Tl, Bi, Te, or an element in the lanthanide or actinide series, or an combination of two or more of said elements.

4,513,094

SINGLE-BATCH PROCESS TO PREPARE NOBLE METAL VANADIUM ALLOY CATALYST ON A CARBON BASED SUPPORT

Francis J. Luczak, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 20, 1983, Ser. No. 506,469
Int. Cl.[3] B01J *21/18, 23/64*
U.S. Cl. 502—101 7 Claims

1. A method for making a finely divided platinum alloy catalyst supported on carbon for use in a fuel cell comprising:
(a) preparing an aqueous dispersion of platinum ions and electrically conductive carbon support particles, heating the dispersion to about 45° C.,
(b) preparing a sulfur ion containing aqueous solution,
(c) adding the sulfur ion solution to the platinum dispersion and agitating while maintaining the dispersion at about 45° C.,
(d) adsorbing the platinum onto the carbon support by intimately contacting the platinum with the support particles by agitating and maintaining the dispersion at about 45° C.,
(e) preparing a second aqueous dispersion containing a salt of an element from transition Groups IV, V, VI or VII,
(f) adding the second aqueous dispersion to the platinum dispersion while maintaining the dispersion at about 45° C. and adjusting the pH to about 5.5,
(g) adsorbing the transition element onto the support particles by agitating while maintaining the dispersion at about 45° C.;
(h) removing the treated support particles from the dispersion, drying, sifting and heating the particles to form the catalyst.

4,513,095

INTERMETALLIC COMPOUNDS OF POLYMERIC TRANSITION METAL OXIDE ALKOXIDES AND CATALYTIC USE THEREOF

Anthony N. Speca, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 209,223, Nov. 24, 1980, abandoned, Ser. No. 209,224, Nov. 24, 1980, abandoned, Ser. No. 209,225, Nov. 24, 1980, abandoned, Ser. No. 209,226, Nov. 24, 1980, abandoned, Ser. No. 209,227, Nov. 24, 1980, abandoned, Ser. No. 209,228, Nov. 24, 1980, abandoned, Ser. No. 209,229, Nov. 24, 1980, abandoned, and Ser. No. 228,831, Jan. 27, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 483,054
Int. Cl.[3] C08F *4/64*
U.S. Cl. 502—111 32 Claims

31. An intermetallic compound comprising the reaction product of a polymeric transition metal oxide alkoxide with aluminum.

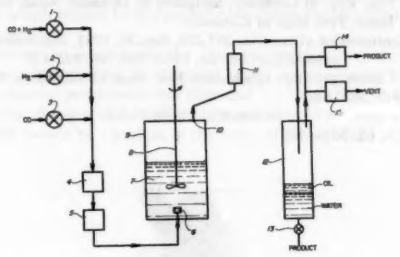
4,513,096

SYNTHESIS GAS REACTION IRON CONTAINING ACTIVE CARBON CATALYSTS

John F. Connolly, Glen Ellyn; Arnold N. Wennerberg, Chicago, and Robert F. Waters, Calumet City, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 497,401, May 23, 1983, Pat. No. 4,478,954. This application Aug. 22, 1984, Ser. No. 643,158
Int. Cl.[3] B01J *23/86, 23/85, 23/76*
U.S. Cl. 502—185 1 Claim

1. An active carbon catalyst comprising a substantially uniform dispersion of at least one of a chromium component, an aluminum component, a manganese component or a tungsten component in a porous carbon matrix and elemental iron either deposited thereon or substantially uniformly dispersed therein, wherein the concentration of active carbon in the catalyst is from about 20 to about 90 weight percent, based on the weight of the catalyst, wherein the concentration of elemental iron in the catalyst is from about 5 to about 50 weight percent, based on the weight of the catalyst, wherein the total concentration of the chromium component, the aluminum component, the manganese component or tungsten component or a combination thereof in the catalyst is from about 5 to about 40 weight percent, based on the weight of the catalyst and calculated as



the elemental metal or metals, and wherein each of the chromium, aluminum, manganese and tungsten components that is present is in the form of the elemental metal, its oxide or a combination thereof.

4,513,097

HYDROTREATING CATALYST AND A METHOD FOR PREPARING THE CATALYST

Paul K. Angmorter, Pomona; Howard D. Simpson, Irvine, and Ryden L. Richardson, Whittier, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 408,264, Aug. 16, 1982, Pat. No. 4,446,248. This application Mar. 9, 1984, Ser. No. 588,115
Int. Cl.[3] B01J *21/04, 23/88, 27/18*
U.S. Cl. 502—211 23 Claims

1. A catalyst composition useful for denitrogenation and desulfurization of hydrocarbon feedstocks by reaction with hydrogen, said catalyst composition comprising molybdenum, nickel and phosphorous active components on support particles comprising gamma alumina, said catalyst having been prepared by a method comprising the steps of:
(a) contacting said support particles with an aqueous ammonia solution;
(b) subsequently impregnating the resultant support particles with molybdenum, nickel and phosphorous by contacting said support particles with an acidic impregnating solution so as to provide composites containing molybdenum, nickel and phosphorous components;
(c) drying composites obtained from step (b) at temperatures less than about 150° F.; and
(d) calcining impregnated particles from step (c) at an elevated temperature in the presence of oxygen.

4,513,098

MULTIMETALLIC CATALYSTS AND THEIR METHOD OF PREPARATION FROM ORGANOMETALLIC PRECURSORS

Ying-Yen P. Tsao, Langhorne, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 28, 1983, Ser. No. 508,407
Int. Cl.[3] B01J *27/02, 31/12;* C10G *35/04, 35/06*
U.S. Cl. 502—216 9 Claims

1. A method for the preparation of multimetallic catalysts which comprises (1) contacting a porous solid refractory inorganic oxide support having suface hydroxyl groups thereon with a non-aqueous solution containing a hydrolysis-sensitive, metal pi-complex organometallic precursor which contains organic ligands, and reducing the resulting complex-containing support to remove said organic ligands therefrom to form a catalyst containing highly dispersed metal and/or metal oxide particles which serve as catchment sites for subsequently added metal complexes; (2) contacting said reduced support

with a non-aqueous solution containing a second metal pi-complex organometallic precursor which reacts with the catchment sites on the reduced support causing attachment of the second organometallic precursor thereto, and reducing the resulting loaded support to form a multimetallic catalyst containing highly dispersed metal and/or metal oxide particles; (3) contacting the resulting catalyst with one or more other metal pi-complex organometallic precursors and reducing the resulting catalyst and (4) activating the resulting catalyst by presulfiding to form a multimetallic catalyst containing highly dispersed metal and/or metal oxide particles.

4,513,099

OLEFIN METATHESIS AND CATALYST

Simon G. Kukes, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 518,557, Jul. 29, 1983, Pat. No. 4,465,891. This application Feb. 27, 1984, Ser. No. 584,220

Int. Cl.³ B01J *27/00, 27/10*

U.S. Cl. 502—228 **12 Claims**

1. A composition suitable for the disproportionation of olefins comprising silicon and at least one metal selected from tungsten, molybdenum, and rhenium produced by

(a) combining the metal or metal compound with a halosilane compound

(b) adding either water or silica to (a), and

(c) heating (b) to activate and form a metal/silicon-containing catalyst active for the disproportionation of olefins.

4,513,100

CATALYTIC SYSTEM FOR PRODUCING MIXTURES OF METHANOL AND HIGHER ALCOHOLS

Vittorio Fattore; Bruno Notari, both of S. Donato Milanese; Alberto Paggini, Spino D'Adda, and Vincenzo Laganà , Milan, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Oct. 28, 1982, Ser. No. 437,439

Claims priority, application Italy, Dec. 2, 1981, 25390 A/81

Int. Cl.³ B01J *23/06, 23/10, 23/26, 23/72*

U.S. Cl. 502—303 **3 Claims**

1. A catalytic system for producing mixtures of methanol and higher alcohols from synthesis gas, and having the empirical formula:

$$Zn.Cr_w.Cu_x.A_y.Me_z.O_t$$

in which

w lies between 0.1 and 0.8,

x lies between 0.005 and 0.05,

y lies between 0.002 and 0.2,

z lies between 0 and 0.1,

t lies between 3.75 and 1.3, its value being that necessary for satisfying the valency with which the various elements appear in the catalyst,

A is at least one alkali metal, and

Me is at least one metal selected from the group consisting of molybdenum, manganese, lanthanum, cerium, aluminum, titanium and vanadium.

4,513,101

SMALL BEAD AUTO EXHAUST CATALYST

Alan W. Peters, Rockville; Gwan Kim, Olney, and Michael V. Ernest, Baltimore, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,809

Int. Cl.³ B01J *21/04, 23/10, 23/58*

U.S. Cl. 502—304 **4 Claims**

1. A catalyst suitable for auto emission control comprising alumina particles having a geometric surface area to bulk volume ratio of from about 17 to 25 cm^2/cm^3, a low compacted bulk density of about 20 to about 36 pounds per cubic foot and a catalytically-effective amount of one or more platinum group metals deposited on the alumina particle.

4,513,102

CATALYST FOR COATING ANODES AND A PROCESS FOR ITS PREPARATION

Ron Hutchings, Rondebosch, South Africa; Ruzica Loitzl, Kirchdorf, and Klaus Müller, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 21, 1984, Ser. No. 581,991

Claims priority, application Switzerland, Mar. 11, 1983, 1344/83

Int. Cl.³ C25B *11/00*

U.S. Cl. 502—325 **5 Claims**

1. A catalytic powder for coating anodes in electrochemical cells, consisting essentially of 2 to 45 mol % of RuO_2, 2 to 45 mol % of IrO_2 and 10 to 96 mol % of SnO_2; wherein said powder belongs, at least partially as a mixed oxide, to the rutile crystal type having uniform lattice parameters, the values of which lie between those of RuO_2 and IrO_2 on the one hand and those of SnO_2 on the other hand.

4,513,103

7-OXABICYCLOHEPTANE ETHERS USEFUL IN THE TREATMENT OF THROMBOLYTIC DISEASE

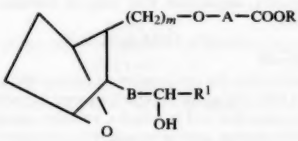
Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 21, 1983, Ser. No. 544,300

Int. Cl.³ A61K *31/34;* **C07D** *307/00*

U.S. Cl. 514—469 **15 Claims**

1. A compound of the structure



including all stereoisomers thereof, wherein m is 1 to 4, A is $(CH_2)_n$ or $-(CH_2)_{n'}-CH=CH-$; n is 1 to 8; n' is 1 or 2; B is $-CH=CH-$ or $-(CH_2)_2-$; R is H, lower alkyl or alkali metal; and R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl or cycloalkylalkyl; wherein the term alkyl by itself or as part of another group contains up to 12 carbon atoms and may be unsubstituted or substituted with halo, trifluoromethyl or alkoxy; the term aryl by itself or as part of another group contains 6 to 10 carbons in the ring portion and may be unsubstituted or substituted with lower alkyl, halogen or lower alkoxy; and the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and may be unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups.

10. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,513,104

PROCESS USING IRON-THALLIUM CATALYSTS IN CO HYDROGENATION

Franklin J. Wright, Watchung; Michael A. Richard, Fanwood, and James C. Pirkle, Lebanon, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 299,014, Sep. 3, 1981, abandoned. This application Mar. 25, 1983, Ser. No. 478,915
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[3] C07C 1/04
U.S. Cl. 518—714 22 Claims

1. A process for producing liquid hydrocarbons, including those in the C_6–C_{11} hydrocarbon range, comprising the steps of:

(a) first depositing thallium on the surface of a supported or unsupported iron catalyst wherein the weight ratio of iron-thallium, taken as the free metals, is from about 100:1 to 1:100, and wherein said iron compounds contain iron value substantially in the trivalent state;

(b) contacting said iron-thallium catalyst with a mixture of CO and H_2 in a volume ratio of about 1:4 to 4:1, respectively, at a temperature ranging from 270° to 550° C., a pressure ranging from 0.1, to 10 MPa and a space velocity ranging from 10 to 10,000 v/v/hr., or equivalent conditions, for a sufficient time to substantially convert said thallium compounds to metallic thallium and said iron compounds to reduced and carbided iron; and

(c) continuing said contacting as described in step (b) at a pressure above 0.1 MPa, a temperature ranging from 230° to 550° C., to produce liquid hydrocarbons comprising about 40 weight percent and greater C_6–C_{11} liquid hydrocarbons and below about 5 weight percent C_{23+} hydrocarbons.

4,513,105

PARTICULATE POLYSTYRENE CONTAINING BLOWING AGENT AND HAVING IMPROVED EXPANDABILITY

Klaus Hahn, Kirchheim; Paül Wittmer, Landau; Isidoor De Grave, Wachenheim; Rupërt Schick, Limburgerhof, and Adolf Echte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 531,658, Sep. 13, 1983,. This application Jun. 21, 1984, Ser. No. 623,211
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234660
Int. Cl.[3] C08J 9/18, 9/20
U.S. Cl. 521—56 1 Claim

1. In a process for the preparation of particulate polystyrene containing a blowing agent in which styrene is polymerized in an aqueous suspension and in which a volatile organic blowing agent is added before, during or after the polymerization has taken place, the improvement which comprises: adding from 0.1 to 10% by weight of a styrene oligomer having a number-average mean molecular weight of from 500 to 5,000 during the polymerization, at a styrene monomer conversion of from 0 to 90%.

4,513,106

PROCESS FOR EXPANDING MICROSPHERES

Anders Edgren; Jan Söderberg, and Bengt Bergström, all of Sundsvall, Sweden, assignors to KemaNord AB, Stockholm, Sweden

Filed Nov. 22, 1983, Ser. No. 554,313
Claims priority, application Sweden, Nov. 26, 1982, 8206733
Int. Cl.[3] C08J 9/22
U.S. Cl. 521—58 8 Claims

1. A method for expanding expandable organic thermoplastic microspheres containing a blowing agent, able to be vaporized upon heating, comprising the steps of

(a) providing a pumpable slurry of the unexpanded microspheres in an inert liquid,

(b) feeding the slurry into a pressure zone in which a pressure above the surrounding pressure is maintained,

(c) feeding to the pressure zone steam of a temperature and in an amount sufficient for heating the microspheres above the vaporization temperature of the blowing agent, at the pressure in the pressure zone, to thereby partially expand the microspheres,

(d) allowing the partially expanded microspheres to leave the pressure zone under a pressure drop whereby the spheres are further expanded and accelerated into a stream with a velocity of at least 1 meter per second,

(e) injecting the accelerated stream into gas volume whereby the stream is disintegrated and cooled, and

(f) separating essentially uniformly expanded and non-agglomerated spheres from the gas.

4,513,107

THERMALLY TRANSFERABLE INK COMPOSITIONS

Charles J. Fabbrini, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1980, Ser. No. 163,884
Int. Cl.[3] C08F 14/06
U.S. Cl. 524—56 17 Claims

1. A thermally transferable ink composition having a 20% elongation temperature of less than about 85° C. and an elongation at break of at least about 15% comprising:

(a) from about 50 to 95% by weight of a thermoplastic polymer selected from the group consisting of polyvinyl chloride, copolymers thereof, and blends thereof;

(b) from about 50 to 5% by weight of a flexibilizer for said thermoplastic polymer that is compatible with said thermoplastic polymer; and

(c) up to about 40% by weight of a colorant

wherein said composition is thermally transferable from a carrier to a receptor at a temperature in the range of 75° C. to 110° C.

4,513,108

THERMOPLASTIC PVC MOLDING COMPOSITIONS

Jesse D. Jones, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 16, 1983, Ser. No. 495,069
Int. Cl.[3] C08L 27/06, 23/28, 25/08, 55/02
U.S. Cl. 524—180 38 Claims

1. A thermoplastic molding composition which comprises in intimate admixture:

(a) a vinyl chloride polymer having a relative viscosity, as measured at a concentration of 1 gram per 100 grams of cyclohexanone at 25° C., falling within the range of from about 1.50 to about 1.85;

(b) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride having a number average molecular weight of at least 30,000 and in which the content of said vinyl aromatic compound is within the range of from about 90 to about 70 weight percent and the content of said anhydride is within the range of from about 10 to about 30 weight percent;

(c) as a first impact modifier, at least 3 parts by weight per hundred parts of components (a) and (b) of chlorinated polyethylene resin; and

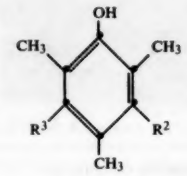
(d) as a second impact modifier, at least 3 parts by weight per hundred parts of components (a) and (b) of either a MBS impact modifier, an ABS impact modifier, a MABS impact modifier or a mixture of two or more of these, articles produced from said molding composition having a heat deflection temperature measured at 66 PSI of at least 75° C.

4,513,109
PHENOLS AND USE THEREOF AS STABILIZERS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 520,374, Aug. 4, 1983, abandoned, which is a continuation of Ser. No. 445,889, Dec. 1, 1982, abandoned. This application Jan. 27, 1984, Ser. No. 574,422
Claims priority, application Switzerland, Dec. 3, 1981, 7734/81
Int. Cl.³ C08K 5/13; C07C 39/12, 39/17
U.S. Cl. 524—342 5 Claims

1. A compound of formula I

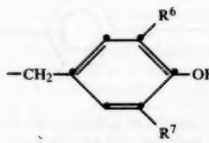


(I)

wherein

R^1 and R^4 are methyl,

R^2 and R^3 are each a radical of formula II



(II)

wherein R^6 is C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, C_6–C_{10} aryl, C_7–C_{10} aralkyl or C_7–C_{10} alkaryl and

R^7 is C_4–C_{12} alkyl, C_5–C_8 cycloalkyl, C_6–C_{10} aryl, C_7–C_{10} aralkyl or C_7–C_{10} alkaryl.

5. A stabilized polymer composition which comprises

(a) a graft polymer based on acrylonitrile, butadiene and styrene or impact-resistant polystyrene, and

(b) an effective amount of a compound according to claim 1.

4,513,110
METHOD OF TREATING DIENE RUBBER AND IMPROVED RUBBER COMPOSITIONS

Charles P. Rader, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 9, 1983, Ser. No. 502,875
Int. Cl.³ C08L 7/00, 9/00, 9/06, 13/00
U.S. Cl. 524—432 35 Claims

1. A method for improving properties of diene rubber comprising incorporating into the rubber, with good dispersion, from 0.1 to 20 parts by weight per 100 parts of the rubber by weight of a compound selected from diketo compounds wherein the keto groups are in the ortho positions of a 6-carbon hydrocarbon ring containing at least one site of carbon-to-carbon unsaturation, or tautomers of said compounds, at an appropriate temperature above 130° C. for from 0.1 to 20 minutes.

26. A modified rubber composition which is the product of the reaction of a diene rubber and from 0.1 to 20 parts by weight per 100 parts of diene rubber by weight of a compound selected from diketo compounds wherein the keto groups are in the ortho positions of a 6-carbon hydrocarbon ring containing at least one site of carbon-to-carbon unsaturation, or tautomers of said compounds.

4,513,111
PROCESS FOR PRODUCING IMPACT-RESISTANT RESINS

Kazuo Kishida; Naoki Yamamoto; Kozi Nishida, all of Ohtake; Toshihito Narita, Yokohama, and Yasumasa Sato, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 227,583, Jan. 23, 1981, abandoned. This application Mar. 8, 1983, Ser. No. 473,369
Claims priority, application Japan, Jan. 30, 1980, 55-9709; Feb. 20, 1980, 55-20159
Int. Cl.³ C08F 2/16; C08L 9/04, 9/08, 9/10
U.S. Cl. 524—458 12 Claims

1. In a process comprising adding an ethylenic monomer or monomer mixture (B) to a rubbery polymer (A) latex, emulsion-polymerizing it to produce a graft copolymer (C) latex, then adding an acidic substance or an electrolyte to said graft copolymer (C) latex to partially coagulate the latex, and thereafter either first adding an ethylenic monomer or monomer mixture (D) and then adding a suspension polymerization stabilizer or simultaneously adding an ethylenic monomer or monomer mixture (D) and a suspension polymerization stabilizer, and carrying out suspension polymerization to obtain a graft copolymer (E) in the form of beads, a process for producing an impactresistant resin wherein:

(1) said rubbery polymer (A) contains at least 60% by weight of a diene monomer component and has a degree of swelling of 10–35, a gel content of 70% by weight or more and a weight average particle diameter of 0.2–0.5μ and the major part of the particles has a particle diameter ranging from 0.03μ to 1.0μ;

(2) said ethylenic monomer or monomer mixture of (B) and (D) independently comprising 50–100% by weight of an aromatic vinyl monomer and 50–0% by weight of a vinyl monomer copolymerizable therewith;

(3) said graft copolymer (C) has a free polymer rate of 10% or higher and a reduced viscosity (η_{sp}/C), determined by dissolving 0.1 g of its acetone-soluble fraction into 100 ml of N,N-dimethylformamide and measuring the viscosity at 20° C., or 0.3–1.0 dl/g;

(4) said rubbery polymer (A) is 25–70% by weight in said graft copolymer (E); and

(5) said acidic substance or electrolyte is added to said graft copolymer (C) latex to form a partial coagulum with a solid content of 15–50%.

4,513,112
HIGH BUILD, AMBIENT CURE COATING COMPOSITIONS

Bruce H. Ernst, Edinboro; Dennis D. Howard, Girard, and Thomas E. Gismondi, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Mar. 7, 1984, Ser. No. 587,032
Int. Cl.³ C08K 3/36
U.S. Cl. 524—590 4 Claims

1. A high build, ambient temperature-curable coating composition comprising a homogeneous mixture of

(a) at least one polymeric compound having at least two free isocyanate groups and containing from 0.5 to 40 percent by weight, based on total weight of such polymeric compound, of polyethylene oxide units having the structure $-(-CH_2CH_2O-)_n$, where n is at least 2;

(b) from 0.5 to 10 percent by weight, based on total weight of said isocyanate-functional ethylene oxide-containing polymeric compound, of colloidal silica; and

(c) at least one curing agent for said isocyanate-functional polymeric compound, wherein said curing agent comprises at least one ketimine, said ketimine comprising the reaction product of at least one aromatic amine having at least two primary amine groups and at least one aliphatic ketone, where the amount of said ketimine is in the range from 0.6 to 1.2 equivalents of amine per equivalent of isocyanate.

2. A high-build, ambient temperature-curable coating composition comprising a homogeneous mixture of

(a) at least one compound having at least two free isocyanate groups and being substantially devoid of polyethylene oxide repeating units having the structure $-(CH_2CH_2O)_n$, wherein n is at least 2;

(b) at least one polymeric compound having at least two free isocyanate groups and containing recurring polyethylene oxide units having the structure $-(CH_2CH_2O)_n$, where n is at least 2, the amount of such isocyanate-functional, polyethylene oxide-containing polymeric compound being sufficient to provide a polyethylene oxide content in the range from 0.5 to 40 percent by weight, based on the total weight of isocyanate-functional compounds(a) and (b);

(c) from 0.5 to 10 percent by weight, based on total weight of isocyanate-functional, polyethylene oxide-containing polymeric compound (b), of colloidal silica; and

(d) at least one curing agent for said isocyanate-functional compounds (a) and (b), wherein said curing agent comprises at least one ketimine, said ketimine comprising the reaction product of at least one aromatic amine having at least two primary amine groups and at least one aliphatic ketone, the amount of said ketimine being sufficient to provide from 0.6 to 1.2 equivalents of amine per equivalent of isocyanate.

4,513,113
AQUEOUS COATING COMPOSITION OF POLYESTERAMIDE

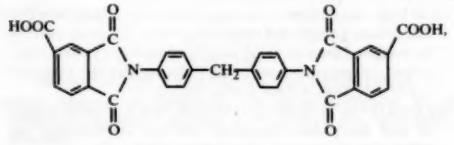
Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 72,496, Sep. 4, 1979, abandoned, which is a division of Ser. No. 726,248, Sep. 24, 1976, Pat. No. 4,217,389, which is a division of Ser. No. 501,932, Aug. 30, 1974, Pat. No. 4,004,062, which is a continuation-in-part of Ser. No. 475,483, Jun. 3, 1974, Pat. No. 4,003,947, which is a continuation-in-part of Ser. No. 467,615, May 6, 1974, Pat. No. 4,073,788, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application Nov. 19, 1981, Ser. No. 323,117

Int. Cl.³ C08G *73/10*; C08L *79/08*

U.S. Cl. 524—602 **5 Claims**

1. A coating composition for application to a substrate from an aqueous solution consisting essentially of the reaction product of isophthalic acid, propylene glycol, and the intermediate reaction product of 4,4'-methylene dianiline and trimellitic anhydride in the molar ratio of one to two respectively and having the structure



said reaction product having an acid number of about 66, and an aqueous solution of a volatile base selected from the group consisting of ammonia, ammonium hydroxide, primary amines, secondary amines, and tertiary amines, to form a solution having a solids level of about 34% and a pH of about 7.4, a coating of said composition on a substrate being curable upon the application of heat to form a cured resin coating on said substrate.

4,513,114
POLYESTER COMPOSITION

Katsuo Kunugi; Togi Suzuki; Tadashi Konishi, all of Matsuyama, and Shinji Ohwaki, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 2, 1984, Ser. No. 636,912

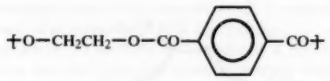
Int. Cl.³ C08K *3/02, 3/32, 5/49*

U.S. Cl. 524—706 **5 Claims**

X 10000

1. A polyester composition comprising:

(A) 100 parts by weight of a matrix polyester resin comprising at least 80 molar % of recurring ethylene terephthalate unit of the formula:



and

(B) 0.2 to 7 parts by weight of a dispersoid in the form of primary fine solid particles and/or secondary agglomerates each consisting of a plurality of said primary fine particles, dispersed in said matrix polyester resin,

said dispersoid being such that, when said dispersoid is contained in a predetermined amount in a typical matrix polyester resin consisting of a polyethylene terephthalate having an intrinsic viscosity of 0.640, the resultant exemplary polyester composition satisfies the relationship (I):

$$-\frac{(\eta\dot{\gamma}_1(w) - \eta\dot{\gamma}_1(0)) - (\eta\dot{\gamma}_2(w) - \eta\dot{\gamma}_2(0))}{\dot{\gamma}_1 - \dot{\gamma}_2} \cong 83w^2 + 275w + 42 \quad (I)$$

wherein w represents the amount in % by weight of said dispersoid based on the entire weight of said exemplary polyester composition; γ_1 and γ_2 represent shearing rates of 0.01 sec^{-1} and 5.0 sec^{-1}, respectively; $\eta\gamma_1(w)$ and $\eta\gamma_2(w)$ represent melt viscosities in poise (1/10 $N{\cdot}sec{\cdot}m^{-2}$) of said exemplary polyester composition containing w % by weight of said dispersoid, determined at shearing rates of γ_1 and γ_2, respectively; $\eta\gamma_1(0)$ and $\eta\gamma_2(0)$ represent melt viscosities in poise (1/10 $N{\cdot}sec{\cdot}m^{-2}$) of said matrix polyester resin free from said dispersoid, determined at shearing rates of γ_1 and γ_2, respectively.

4,513,115
LOW MODULUS ONE COMPONENT RTV COMPOSITIONS PROCESSES

Dale M. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 349,537, Feb. 17, 1982, abandoned. This application Jul. 11, 1983, Ser. No. 512,566

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—731 **120 Claims**

1. A stable, one-package, substantially anhydrous and sub-

stantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer comprising: (1) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least 2 alkoxy radicals; (2) an effective amount of a condensation catalyst; (3) a stabilizing amount of silane scavenger for hydroxy functional groups having the formula

$$(R^1O)_{4-(c+f)}\overset{(R^2)_c}{\overset{|}{Si}}(X)_f$$

where R^1 is a $C_{(1-8)}$ aliphatic organic radical selected from the group consisting of alkyl, alkylether, alkylester, alkylketone, and alkylcyano radicals, or a $C_{(7-13)}$ aralkyl radical, R^2 is a $C_{(1-13)}$ monovalent substituted or unsubstituted hydrocarbon radical, X is a hydrolyzable leaving group selected from the group consisting of amido, amino. carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato, and ureido radicals, and c is a whole number equal to 0 to 3, inclusive, f is an integer equal to 1 to 4 inclusive, and the sum of c+f is equal to 1 to 4 inclusive; and (4) where X is enoxy or amido, an effective amount of a curing accelerator selected from the group consisting of substituted guanidines, amines and mixtures thereof; and (5) from 2 to 20 parts by weight per 100 parts by weight of said organopolysiloxane of a first plasticizer fluid containing a high degree of trifunctionality or mixtures of tri- and tetrafunctionality and comprising

(i) from 5 to 60 mole percent of monoalkylsiloxy units, siloxy units or a mixture of such units;

(ii) from 1 to 6 mole percent of trialkylsiloxy units and

(iii) from 34 to 94 mole percent of dialkyl siloxy units, said polysiloxane containing from about 0.1 to about 2% by weight of silicone-bonded hydroxyl groups.

4,513,116
PROCESS FOR THE MANUFACTURE OF HALOGENATED POLYMERS

Ronald C. Kowalski, New Providence; William M. Davis; Neil F. Newman, both of Edison, all of N.J., and Lewis Erwin, Winchester, Mass., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 1, 1983, Ser. No. 481,366
Int. Cl.³ C08F *8/22*
U.S. Cl. 525—53 **79 Claims**

1. A process for the continuous production of halogenated polymer wherein polymer and halogenating agent are contacted in a continuous flow device comprising means for conveying said polymer through said device wherein said polymer and said halogenating agent are present during contact as either co-continuous phases or wherein said halogenating agent is present as a continuous phase and said polymer is present as a discontinuous phase and said polymer is subject to deformation, disruption and generation of new surface and means for disengaging by-product of the halogenation reaction and unreacted halogenating agent from said halogenated polymer.

4,513,117
PROCESS FOR CONVERSION OF VINYL COPOLYMERS TO VINYLIC ALCOHOL COPOLYMERS BY HOMOGENEOUS REACTION WITH ORGANOMETALLIC COMPOUNDS

Richard W. Fries, Joliet, Ill., assignor to Northern Petrochemical Company, Omaha, Nebr.

Filed May 7, 1984, Ser. No. 607,709
Int. Cl.³ C08F *8/12, 8/36*
U.S. Cl. 525—60 **6 Claims**

1. A process for producing vinylic alcohol copolymers by reacting an organometallic compound wherein the metal is selected from the group consisting of titanium, magnesium, aluminum, and zinc with a copolymer selected from the group consisting of (a) copolymers of a vinyl ester and a comonomer selected from the group consisting of alpha olefins and styrene and (b) copolymers of carbon monoxide and a comonomer selected from the group consisting of alpha olefins and styrene.

4,513,118
EMULSION POLYMERS FOR MODIFYING IMPACT STRENGTH

Norbert Suetterlin, Ober-Ramstadt; Peter J. Arndt, Seeheim-Jugenheim; Ernst Heil, Stockstadt; Werner Siol, Darmstadt; Willi Tilch, Reinheim, and Wilhelm Wopker, Bickenbach, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 3, 1984, Ser. No. 567,793
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1983, 3300526
Int. Cl.³ C08L *33/08, 33/12*
U.S. Cl. 525—81 **4 Claims**

1. A multistage emulsion polymer adaptable to inclusion in a transparent methyl methacrylate thermoplastic molding compound to improve the impact strength thereof without loss of transparency and without stress whitening, said polymer comprising

(a) a hard, nonelastomeric core polymer having a glass transition temperature above 50° C., produced by the emulsion polymerization of a monomer component consisting of at least 80 percent by weight of methyl methacrylate and up to 20 percent by weight of at least one other, different, ethylenically unsaturated monomer copolymerizable therewith;

(b) an elastomeric intermediate polymer having a glass transition temperature below 0° C., produced by the emulsion polymerization, in the presence of the hard core polymer (a), of a monomer mixture consisting of (i) at least 90 percent by weight of at least one monoethylenically unsaturated monomer of which at least 50 percent by weight is at least one alkyl ester of acrylic acid having from 1 to 18 carbon atoms in the alkyl group or at least one alkyl ester of methacrylic acid having from 4 to 18 carbon atoms in the alkyl group, (ii) 0.2 to 3 percent, by weight of the mixture of stage (b), of at least one polyfunctional monomer having three or more acrylic or methacrylic groups, and (iii) the balance being at least one further monoethylenically unsaturated monomer such that the refraction index of polymer (b) matches that of polymethyl methacrylate; and

(c) a hard, nonelastomeric final polymer having a glass transition temperature above 50° C., produced by the emulsion polymerization, in the presence of the elastomeric polymer (b), of a monomer component consisting of at least 80 percent by weight of methyl methacrylate and up to 20 weight percent of at least one other monoethylenically unsaturated monomer copolymerizable therewith.

4,513,119
POLYCARBONATE RESIN MIXTURES

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Apr. 21, 1983, Ser. No. 487,170
Int. Cl.³ C08L *53/02, 23/00, 69/00*
U.S. Cl. 525—92 **9 Claims**

1. A resin mixture comprising:

(a) from about 60 to about 92 parts by weight of an aromatic polycarbonate resin; and

(b) a modifier combination therefor comprising

(i) from about 5 to about 20 parts by weight of a coupled resinous block-copolymer having blocks comprising polymerized vinyl aromatic units connected to blocks comprising polymerized diene units, wherein the residual dienic unsaturation is not removed by selective hydrogenation;

(ii) from about 2 to about 20 parts by weight of a copolymer of an olefin and at least one of a C_1–C_6 alkyl acrylate, a C_1–C_6 alkyl methacrylate, acrylic acid, methacrylic acid, or a mixture of any of the foregoing; and

(iii) from about 1 to about 10 parts by weight of a precompounded homogeneous resin composition, compatible under working conditions, of an olefinic resin selected from the group consisting of a polyethylene resin, a polypropylene resin, a polyethylene copolymer resin in which a major weight percentage of said copolymer comprises polyethylene, a polypropylene copolymer resin in which a major weight percentage of said copolymer comprises polypropylene and a mixture of polyethylene or polypropylene and one of the foregoing copolymers and an elastomeric polyisobutylene resin,

said modifier being present in said mixture in an amount at least sufficient to impart to said mixture a resistance to environmental stress crazing and cracking greater than that possessed by said polycarbonate resin, per 100 parts by weight of components (a), (b)(i), (b)(ii), and (b)(iii) combined, said polycarbonate resin comprising the reaction product of a dihydric phenol and a carbonate precursor, the dihydric phenol consisting essentially of one or more of the following dihydric phenols

2,2-bis-(4-hydroxyphenyl)propane;
hydroquinone;
resorcinol;
2,2-bis-(4-hydroxyphenyl)pentane;
2,4'-(dihydroxydiphenyl)methane;
bis-(2-hydroxyphenyl)methane;
bis-(4-hydroxyphenyl)methane;
bis-(4-hydroxy-5-nitrophenyl)methane;
1,1-bis(4-hydroxyphenyl)ethane;
3,3-bis(4-hydroxyphenyl)pentane;
2,2-dihydroxydiphenyl;
2,6-dihydroxynaphthalene;
bis-(4-hydroxydiphenyl)sulfone;
2,4'-dihydroxydiphenyl sulfone;
5'-chloro-2,4'-dihydroxydiphenyl sulfone;
bis-(4-hydroxyphenyl)diphenyl sulfone;
4,4'-dihydroxydiphenyl ether; and
4,4'-dihydroxy-3,3'-dichlorodiphenyl ether.

4,513,120
POLYPHENYLENE ETHER COMPOSITIONS

James G. Bennett, Jr., Menands, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 246,383, Mar. 23, 1981, Pat. No. 4,373,064, which is a continuation of Ser. No. 846,544, Oct. 28, 1977, abandoned, which is a continuation of Ser. No. 725,740, Sep. 23, 1976, abandoned, which is a continuation of Ser. No. 283,093, Aug. 23, 1972, abandoned. This application Dec. 9, 1982, Ser. No. 448,262

The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.

Int. Cl.[3] **C08F** *253/00, 257/02, 279/00*

U.S. Cl. 525—316 **3 Claims**

1. A rubber modified polystyrene resin, said rubber modified polystyrene comprising a polystyrene matrix in which there is uniformly dispersed a discontinuous phase comprising particles of a styrene homopolymer englobulated in a diene rubber membrane, said particles having an average size ranging from about 0.1 to about 0.7 microns, the membrane thickness being not in excess of about $\frac{1}{4}$th the average particle diameter, and the diene rubber content being from about 1 to about 10% by weight of the rubber modified polystyrene.

4,513,121
WET STRENGTH MATERIAL

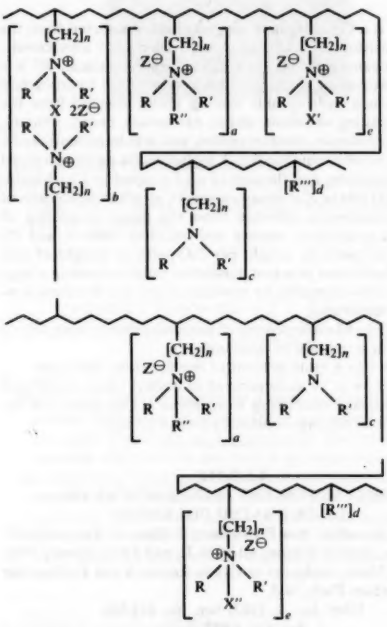
Per E. A. Hansson, and Felek Jachimowicz, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,584

Int. Cl.[3] **C08S** *8/32*

U.S. Cl. 525—332.3 **6 Claims**

1. A polymeric product comprising a water soluble polymer having a substantially completely saturated polymeric backbone chain with a pendant alkylene amine groups represented by the formula:



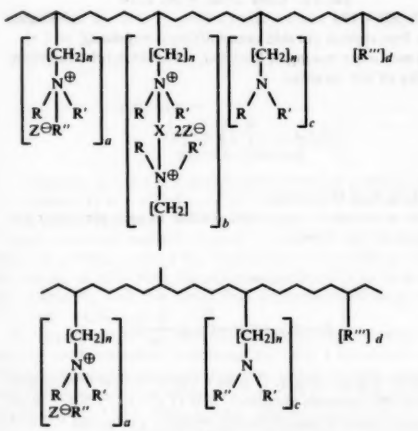
wherein ~~~ represents a substantially saturated hydrocarbon polymer chain, each R separately represents an unsubstituted or substituted C_1–C_6 alkyl, cycloalkyl or aryl; R' represents hydrogen or an R group; R'' represents hydrogen or a C_1–C_3 alkyl; R''' represents hydrogen or a comonomer pendant group or both, X is a residual organic group of a compound capable of covalently bonding with at least two nitrogen atoms of the polymer; X' represents a residual organic group having at least one unreacted functional group capable of reacting with secondary or tertiary amine or secondary hydroxy group; Z is a counterion; n is an integer of from 1 to 3; a, b, c, d and e are each integers such that a, c and e is from about 1 to 90 percent, b is from about 1 to 30 percent and d is from about 1 to 60 percent of the total sum of a+b+c+d+e; and the sum of the groups of a+c+e is at least 4 weight percent of the polymer product; said polymer is formed by reacting under substantially anhydrous conditions an olefinic bond containing polymer with an amine selected from a primary or secondary amine, hydrogen and carbon monoxide in the presence of a Group VIII metal containing compound to form a polymeric material having pendant alkylene amine groups and further reacting a portion of the alkylene amine groups with an agent which is at least difunctional with respect to the pendant secondary and tertiary amino groups, said difunctional agent being in molar ratio of from 0.3 to 1.1 with respect to said secondary amino groups and from 0.5 to 2.2 with respect to said tertiary amino groups.

4,513,122
RETENTION AND DRAINAGE AID

Eric A. Hansson and Felek Jachimowicz, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,807
Int. Cl.³ C08F 8/32
U.S. Cl. 525—332.3 22 Claims

1. A polymeric product comprising a water soluble polymer having a substantially completely saturated polymeric backbone chain with a pendant alkylene amine groups represented by the formula:



wherein ~~~represents a substantially saturated hydrocarbon polymer chain, each R separately represents an unsubstituted or substituted C_1–C_6 alkyl, cycloalkyl or aryl; R′ represents hydrogen or an R group; R″ represents hydrogen or a C_1–C_3 alkyl; R‴ represents hydrogen or a comonomer pendant group or both, X is a residual organic group of a compound capable of covalently bonding with at least two nitrogen atoms of the polymer and Z is a counterion; n is an integer of from 1 to 3; a, b, c, d and e are each integers such that a, c and e is from about 1 to 90 percent, b is from about 1 to 30 percent and d is from about 1 to 60 percent of the total sum of a+b+c+d+e; and the sum of the groups of a+c+e is at least 4 weight percent of the polymer product; said polymer is formed by reacting under substantially anhydrous conditions an olefinic bond containing polymer with an amine selected from a primary or secondary amine, hydrogen and carbon monoxide in the presence of a Group VIII metal containing compound to form a polymeric material having pendant alkylene amine groups and further reacting a portion of the alkylene amine groups with an agent which is at least difunctional with respect to the pendant secondary and tertiary amino groups, said difunctional agent being in molar ratio of from 0.3 to 1.1 with respect to said secondary amino groups and from 0.5 to 2.2 with respect to said tertiary amino groups.

4,513,123
SULFUR-CURABLE RUBBER SKIM STOCK COMPOSITIONS CONTAINING DITHIODIPROPIONIC ACID

Gary L. Day, Akron, and James P. Robertson, Norton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 14, 1983, Ser. No. 551,524
Int. Cl.³ C08C 19/20
U.S. Cl. 525—332.6 9 Claims

1. A sulfur-curable rubber skim stock composition which comprises:

(a) 100 parts by weight of a rubber selected from the group consisting of natural rubber and blends of natural rubber and synthetic rubber;

(b) from about 30.0 to about 80.0 parts by weight of carbon black;

(c) an organo-cobalt compound present in sufficient amount to provide from about 0.05% to about 0.35% by weight of cobalt metal based on total weight of skim stock;

(d) from about 2.5 to about 9.0 parts by weight of sulfur; and

(e) from about 0.1 to about 2.5 parts by weight of dithiodipropionic acid.

4,513,124
PREPARATION OF A COPOLYMER POLYAHL USING AN ADDITION POLYMERIZABLE ADDUCT OF A POLYMERIC MONOAHL AND AN ETHYLENICALLY UNSATURATED COREACTANT

Dwight K. Hoffman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 195,155, Oct. 8, 1980, Pat. No. 4,394,491. This application Feb. 14, 1983, Ser. No. 466,240
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.
Int. Cl.³ C08G 18/14, 18/48; C08L 71/02, 75/08
U.S. Cl. 525—452 11 Claims

1. A method for making a stable dispersion of an addition copolymer in a polyahl which method comprises polymerizing an ethylenically unsaturated monomer dispersed in a continuous liquid phase of a polyahl which contains a dispersion stabilizing amount of an ethylenic addition polymerizable adduct of a monoahl and an active ethylenically unsaturated coreactant monomer having a coreactive moiety, said monoahl being an organic compound containing only one active hydrogen moiety capable of reacting with the coreactive moiety of the coreactive monomer to form the adduct and said polyahl being an organic compound having at least two active hydrogen moieties wherein the compound has a number average molecular weight of at least 62.

5. A stable copolymer dispersion comprising

(a) a polyahl having a number average molecular weight less than 400; and dispersed therein

(b) an ethylenic addition copolymerizate of (1) an ethylenic addition polymerizable adduct of a monoahl and an active ethylenically unsaturated coreactant monomer having a coreactive moiety and (2) at least one ethylenically unsaturated monomer other than the coreactant monomer ("other monomer"); or

(c) a mixture of (1) an adduct of (i) a monoahl and (ii) an addition copolymer of the coreactant monomer with at least one "other monomer" which is nonreactive with the coreactant monomer and the monoahl and (2) an ethylenic addition polymer of at least one "other monomer"; or

(d) a combination of (b) and (c); or

(e) a combination of (b) and/or (c) and an ethylenic addition polymer of at least one "other monomer," said monoahl and coreactant monomer being present in reacted form in an amount sufficient to stabilize the dispersion, said monoahl being an organic compound containing only one active hydrogen moiety capable of reacting with the coreactive moiety of the coreactive monomer to form the adduct and said polyahl being an organic compound having at least two active hydrogen moieties wherein the compound has a number average molecular weight of at least 62.

10. A polyurethane prepared by reacting the copolymer dispersion of claim 5 with an organic polyisocyanate.

11. The polyurethane of claim 10 in the form of a foam.

4,513,125

CROSSLINKABLE COMPOSITION OF MATTER - II

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 6, 1983, Ser. No. 456,068

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[3] **C08F** *283/00;* **C08G** *59/14*

U.S. Cl. 525—528 **30 Claims**

1. A crosslinkable composition of matter, which composition comprises:

A. substantially gel-free diene-functionalized epoxy-amine adduct, comprising the reaction product of (i) polyhydroxy functional epoxy-amine reactant comprising the reaction product of polyepoxy reactant having an average of at least about 2 epoxy groups per molecule with secondary amine reactant having a total of less than about 20 carbons per amino nitrogen, wherein each hydroxy group, if any, of the secondary amine is removed at least 1 carbon from each amino nitrogen, with (ii) diene functional mono-isocyanate reactant; and

B. substantially gel-free substantially isocyanate-free dieneophile-functionalized polyisocyanate oligomer having number average dieneophile-functionality of at least about three, comprising the reaction product of (i) polyisocyanate reactant, with (ii) isocyanate-reactive dieneophile functional reactant, wherein said polyisocyanate reactant and said dieneophile functional reactant are reacted in molar equivalent ratio of one to at least about one, respectively.

4,513,126

ACRYLONITRILE POLYMER, PROCESS FOR THE PREPARATION THEREOF AND FIBER PREPARED THEREFROM

Kaoru Yamazaki, Akashi, and Fukashi Shibuya, Kobe, both of Japan, assignors to Konegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1982, Ser. No. 444,327

Claims priority, application Japan, Nov. 27, 1981, 56-191379

Int. Cl.[3] **C08F** *2/00*

U.S. Cl. 526—87 **3 Claims**

1. An acrylonitrile polymer consisting essentially of 40 to 80% by weight of acrylonitrile, 16 to 59.9% by weight of at least one of vinyl chloride and vinylidene chloride, 0–10% by weight of a copolymerizable monoolefinic monomer and 0.1 to 4% by weight of a mixture of (A) a sulfo group-containing vinyl monomer having a higher reactivity ratio than acrylonitrile selected from the group consisting of methacryloyloxypropylsulfonic acid, styrene sulfonic acid, vinylbenzylsulfonic acid, and salts thereof and (B) a methallyl sulfonic acid monomer selected from the group consisting of methallyl sulfonic acid and salts thereof, said acrylonitrile polymer being prepared by a solution polymerization process in which (1) the addition of the sulfo group-containing vinyl monomer (A) is completed before 70% by weight of the final polymer is produced, (2) the sulfo group-containing vinyl monomer (A) is added to the polymerization system so that the amount of the polymer produced within the period of actual addition of the sulfo group-containing vinyl monomer (A) is not more than 40% by weight of the final polymer, and (3) at least half the amount of the methallyl sulfonic acid monomer (B) to be used is added to the polymerization system substantially within the addition and reacting period of the sulfo group-containing vinyl monomer (A), the addition and reacting period of the sulfo group-containing vinyl monomer (A) being the total period of the actual addition of the sulfo group-containing vinyl monomer (A) to the polymerization system plus a period subsequent to each addition of the sulfo group-containing vinyl monomer (A) to the polymerization system during which 10% by weight of the final polymer is produced; and wherein the ratio of the sulfo group-containing vinyl monomer (A) to the methallyl sulfonic acid monomer (B) is from ¼ to 9/1 by weight; with the proviso that all of the sulfo group-containing vinyl monomer (A) and all of the methallyl sulfonic acid monomer (B) are not added to the polymerization system at one time prior to the initiation of the polymerization reaction.

4,513,127

SOLUBLE SULFIMIDE ACCELERATORS FOR FREE RADICAL CURED COMPOSITIONS

Anthony F. Jacobine, Meriden, Conn., assignor to Loctite Corporation, Newington, Conn.

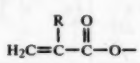
Filed Sep. 13, 1984, Ser. No. 650,750

Int. Cl.[3] **C08F** *2/00, 4/00, 4/16*

U.S. Cl. 526—194 **13 Claims**

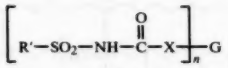
1. A free radical curable composition comprising;

(a) a monomer having at least one cureable acrylic functionality of the formula:



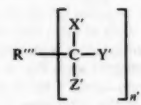
where R is H or alkyl;

(b) an accelerator compound soluble in said monomer defined by the formula:



where n is an integer, G is an n valent radical compatable with the cureable monomer; X is O, O—O, S NR^{11}; R^1 is a substituted or unsubstituted aromatic group and R^{11} is H or aryl; and, where X is not O—O,

(c) an initiator selected from hydroperoxides, peroxyesters, peroxycarbamates and halogen containing compounds defined by the formula:



wherein:

X^1 is selected from H, CH_3, Cl and Br; Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^{111} is selected from the group consisting of aromatic and heteroaromatic residues; and n^1 is an integer from 1 to 3 inclusive.

4,513,128

FLUORINATED VINYL ETHER COPOLYMERS HAVING LOW GLASS TRANSITION TEMPERATURES

Ronald E. Uschold, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 23, 1983, Ser. No. 507,083

Int. Cl.[3] **C08F** *214/18, 214/24, 214/26*

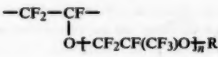
U.S. Cl. 526—212 **10 Claims**

1. Substantially amorphous, fluorine-containing perhalogenated copolymer having a glass transition temperature of −15° C. to −100° C. and consisting essentially of the following structural repeat units in the recited molar amounts, with the total of the amounts being 100%:

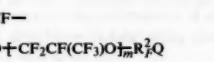
(a) about 50 to about 80% of $—CF_2CX^1X^2—$ wherein each of X^1 and X^2 is independently selected from F and Cl;

(b) 5 to about 50% of

wherein R_F is C_{1-5} perfluoroalkyl;
(c) about 3 to about 50% of



wherein R_F^1 is C_{1-12} perfluoroalkyl and n is an integer and is 3 to 30: and
(d) 0 to about 10% of



wherein R_F^2 is C_{1-12} perfluoroalkylene or perfluorophenylene, Q is $-CO_2R$, —CN, —F, —Cl, —Br or I, R is C_1–C_4 alkyl, and
m is an integer and is 1, 2 or 3;
with the proviso that (i) the total molar concentration of (b), (c) and (d) is 20 to 50%; (ii) the concentration of (c) is at least 20 weight %; and (iii) when R_F^2 is perfluoroalkylene, Q is $-CO_2R$, —CN, —Br or —I.

8. Preparation of the substantially amorphous, fluorine-containing perhalogenated copolymer of claim 1 by means of an improved aqueous emulsion polymerization process comprising polymerizing appropriate monomers in an aqueous medium in the presence of a redox couple initiator and a surfactant at 20° C. to 90° C., the improvement consisting of polymerizing appropriate amounts of monomers of the formulas $CF_2=CX^1X^2$, $CF_2=CFOR_F$, $CF_2=CFO-CF_2CF(CF_3)O-_nR_F^1$ and $CF_2=CF_2O-CF_2CF(CF_3)O-_mR_F^2Q$ wherein X^1, X^2, R_F, R_F^1, R_F^2, Q, n and m are as defined in claim 1, in the presence of a fluorinated alcohol which is soluble in water and in the monomer of the formula $CF_2=CFO-CF_2CF(CF_3)O-_nR_F^1$.

4,513,129

ETHYLENE/TETRAFLUOROETHYLENE OR CHLOROTRIFLUOROETHYLENE COPOLYMER

Shinichi Nakagawa, Nara; Kiyohiko Ihara, and Toshio Sogabe, both of Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 18, 1984, Ser. No. 601,432
Claims priority, application Japan, Apr. 25, 1983, 58-73562
Int. Cl.³ C08F *12/20*
U.S. Cl. 526—249 **16 Claims**

1. A copolymer comprising monomeric units derived from ethylene, tetrafluoroethylene or chlorotrifluoroethylene and a fluorovinyl compound of the formula:

$$CH_2=CFRf \quad (I)$$

wherein Rf is a C_2–C_{10} fluoroalkyl group, the molar ratio of ethylene and tetrafluoroethylene or chlorotrifluoroethylene being from 40:60 to 60:40 and the content of the fluorovinyl compound being from 0.1% to 10% by mole.

7. A copolymer comprising monomer units derived from ethylene, tetrafluoroethylene and a fluorovinyl compound of the formula:

$$CH_2=CFRf$$

wherein Rf is a C_2–C_8 fluoroalkyl group selected from the group consisting of perfluoroalkyl, omega-hydroperfluoroalkyl, and omega-chloroperfluoroalkyl, the molar ratio of ethylene and tetrafluoroethylene being from 40:60 to 60:40 and the content of the fluorovinyl compound being from 0.1% to 10% by mole.

4,513,130

HYDROCARBON RESIN AND MODIFIED HYDROCARBON RESIN PRODUCT THEREOF

Kinya Mizui; Masami Takeda, both of Otake, and Tadao Iwata, Chiba, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,899
Claims priority, application Japan, Sep. 7, 1981, 56-140738
Int. Cl.³ C08F *232/08*
U.S. Cl. 526—283 **15 Claims**

1. A hydrocarbon resin consisting essentially of a copolymer of (A) at least one unsaturated hydrocarbon selected from the group consisting of (i) unsaturated chain hydrocarbons and (ii) cyclic hydrocarbons having vinylidene group and (B) at least one compound selected from the group consisting of 9,10-dihydrodicyclopentadiene and its derivatives, the amount of the polymerization unit of component (A) in the copolymer being 20 mol% to 98 mol% and that of component (B) in the copolymer being 80 mol% to 2 mol%.

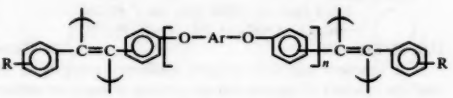
4,513,131

THERMALLY STABLE PHENYLACETYLENE TERMINATED ARYLETHER RESINS

Bruce A. Reinhardt, 1115 Edgebrook Dr., New Carlisle, Ohio 45344; Fred E. Arnold, 1583 Ambridge Rd., Centerville, Ohio 45459, and Marilyn R. Unroe, 69 Baltimore St., Dayton, Ohio 45404

Filed Jul. 25, 1984, Ser. No. 634,345
Int. Cl.³ C08F *38/00*
U.S. Cl. 526—285 **6 Claims**

1. A thermally stable resin of the general formula



wherein Ar is a divalent aromatic moiety, n is an integer in the range of 1 to 3, and R is —H, $-O-C_6H_5$, $-O-C_6H_5$ or $-O-C_6H_4-SO_2-C_2H_5$.

4,513,132

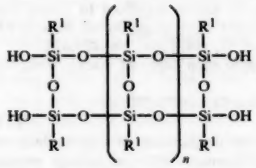
HEAT-RESISTANT SILICONE BLOCK POLYMER

Fusaji Shoji; Issei Takemoto; Fumio Kataoka, all of Yokohama; Hitoshi Yokono, and Tokio Isogai, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 480,789
Claims priority, application Japan, Apr. 2, 1982, 57-53815
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—21 **7 Claims**

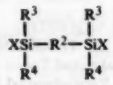
1. A heat-resistant silicone block polymer obtained by reaction of 100 parts by weight of organosilsesquioxane having the following formula (5):

(5)



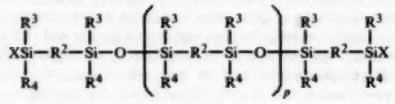
wherein R^1 is a lower alkyl group having 1 to 5 carbon atoms and/or an aryl group and n is an integer of from 0 to 4,000,

with 5 to 400 parts by weight of a silicone compound or organosiloxane represented by the formula (6) or (7):



(6)

wherein R^2 is an arylene group, R^3 and R^4 are lower alkyl groups having 1 to 5 carbon atoms, alkenyl groups and/or aryl groups, and X is a chlorine atom, a hydroxyl group, an alkoxy group or an N,N-dialkylamino group, or



(7)

wherein R^2, R^3 and R^4 and X have the same meanings as defined heretofore and p is an integer of from 0 to 100, in an organic solvent and in the presence of 0.1 to 200 parts by weight of a basic catalyst per 100 parts by weight of the compound of the general formula (5).

4,513,133

REACTION INJECTION MOLDED ELASTOMERS CONTAINING LOW MOLECULAR WEIGHT ORGANIC ACIDS

Richard J. G. Dominguez, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,234

Int. Cl.³ C08G *18/34, 18/48, 18/50*

U.S. Cl. 528—49 **24 Claims**

1. A reaction injection molded elastomer comprising the reaction product of ingredients comprising primary or secondary amine terminated polyethers of at least 2,500 molecular weight having greater than 50% of their active hydrogens in the form of amine hydrogens, a chain extender, an aromatic polyisocyanate and a low molecular weight organic acid in an amount effective to provide improved green strength, represented by the formulae:

$$R(CO_2H)_n \text{ or } (CO_2H)_2$$

where R=H or contains from 1 to 9-n carbon atoms and n=1-3.

4,513,134

METHOD OF PREPARATION OF 3-METHYLENE CEPHAM COMPOUNDS

Wan J. Kim; Cheol H. Lee, both of Seoul, and Moon H. Lee, Inchon, all of Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

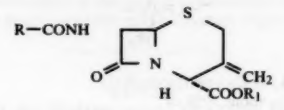
Filed Apr. 21, 1983, Ser. No. 487,421

Claims priority, application Rep. of Korea, Feb. 7, 1983, 1983-460

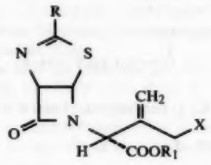
Int. Cl.³ C07D *501/02*

U.S. Cl. 544—16 **12 Claims**

1. A method for the preparation of 3-methylene cepham compounds of the formula (I) comprising reacting 3-halomethyl butenoate derivatives of thiazolinoazetidinone of the formula (II) with an aqueous acid solution in a mixed organic solvent.



(I)



(II)

Wherein R is benzyl or phenoxymethyl, R_1 is a carboxylic acid protecting group and X is halogen.

4,513,135

DIARYL-PYRAZINE DERIVATIVES AFFECTING GABA BINDING

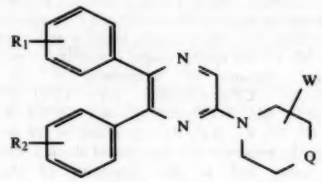
David T. Wong, and William B. Lacefield, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 5, 1982, Ser. No. 354,982

Int. Cl.³ C07D *241/10, 211/10, 211/18, 211/40*

U.S. Cl. 544—120 **10 Claims**

1. A compound of the formula



wherein

each R_1 and R_2 is independently C_1–C_3 alkyl

Q is oxygen or $—(CH_2)_n—$, where n is 0, 1, or 2;

W is hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, keto, hydroxyimino, $(—OCH_2)_2$, hydroxy, hydroxymethyl, —OCHO, —OCOA, $—OSO_2A$, or —COB, where A is C_1–C_4 alkyl, phenyl, phenoxy, amino, C_1–C_3 alkyl substituted phenyl, or mono- or di-C_1–C_3 alkyl amino, and where B is C_1–C_3 alkoxy, amino, or mono- or di-C_1–C_3 alkylamino;

subject to the limitations that when Q represents oxygen, W is limited to hydrogen, and that when Q represents $—(CH_2)_n—$, W, except when hydrogen or C_1–C_3 alkyl, is not on a carbon atom adjacent to the ring nitrogen atom.

4,513,136

PROCESS FOR RECOVERING CAFFEINE FROM ACTIVATED CARBON

Saul N. Katz, Monsey, and George E. Proscia, West Sayville, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 306,276, Sep. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 159,724, Jun. 16, 1980, Pat. No. 4,298,736. This application Apr. 18, 1983, Ser. No. 484,354

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.³ C07D *473/12*

U.S. Cl. 544—275 **5 Claims**

1. A process for recovering caffeine from activated carbon comprising:

contacting activated carbon having caffeine adsorbed thereon with an aqueous acetic acid solution having a concentration of between about 50% and 80%, by weight, and which is capable of displacing at least a portion of the caffeine from active sites on the carbon;

maintaining the contact for a period of time, and at a temperature of at least 100° C., effective for the solution to displace at least a portion of the caffeine from the carbon and dissolve and displaced caffeine;

separating the carbon from the solution; and

recovering the caffeine from the solution by steam distilling the solution or evaporating the solution.

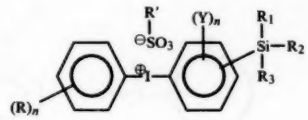
4,513,137

IODONIUM SALTS

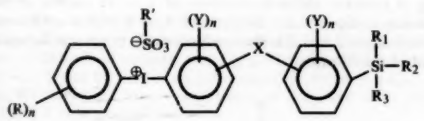
Gerald F. Koser, Munroe Falls, and Carol S. Carman, Alliance, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Apr. 9, 1981, Ser. No. 252,327
Int. Cl.³ C07D *213/26*
U.S. Cl. 546—14 **20 Claims**

1. An iodonium salt, comprising: a compound having the formula



or the formula



where n of $(R)_n$ is from 1 to 5,

where R can be benzo, a halo, an alkyl having from 1 to 20 carbon atoms, a cycloalkyl having from 3 to 20 carbon atoms, an aryl having from 6 to 40 carbon atoms, a halogen substituted aryl wherein said aryl has from 6 to 40 carbon atoms, a naphthyl, a halo substituted naphthyl, an alkyl substituted naphthyl wherein said alkyl has from 1 to 20 carbon atoms, a cycloalkyl substituted naphthyl wherein said cycloalkyl has from 3 to 20 carbon atoms, a hetero atom substituent substituted on an aryl with said aryl having from 6 to 40 carbon atoms, said hetero atoms selected from the group consisting of CN, NO_2, COOH, CHO, OH, an alkoxy having from 1 to 5 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof; a pyridinyl, alpha or beta furyl, thienyl, and combinations thereof;

wherein said R′ is hydrogen, an alkyl having from 1 to 20 carbon atoms, an aryl having from 6 to 40 carbon atoms, a halogen substituted aryl wherein said aryl has from 6 to 40 carbon atoms, a hetero atom substituent substituted on an aryl having from 6 to 40 carbon atoms, said hetero atom substituent selected from the group consisting of CN, NO_2, COOH, CHO, an alkoxy having from 1 to 6 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof;

wherein Y is hydrogen, an alkyl having from 1 to 5 carbon atoms, an aryl having from 6 to 12 carbon atoms, a halo, and a hetero group selected from the group consisting of NO_2, CN, COOH, CHO, OH, and combinations thereof;

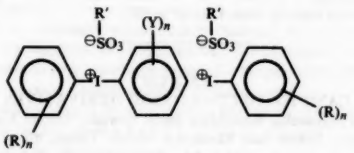
wherein R_1, R_2, and R_3 is hydrogen, an alkyl having from 1 to 5 carbon atoms, a halo, an aryl having from 6 to 24 atoms, an alkoxy having from 1 to 5 carbon atoms;

wherein X is O, NH, S,

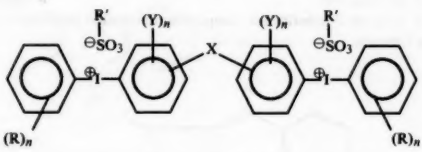
Sn, SO, SO_2, a ketone group, N–R‴ where R‴ is an alkyl having from 0 to 5 carbon atoms or an aryl having from 6 to 12 carbon atoms, $—CH_2—_n$ where n is from 0 to 10, —CR′$_2$—C where R′ is an alkyl having from 0 to 5 carbon atoms, —C aryl (n) wherein said aryl has from 6 to 12 carbon atoms, and n is from 1 to 10; a —SiR‴$_{2(n)}$ where said R‴ is an alkyl having from 0 to 5 carbon atoms or an aryl having from 6 to 12 carbon atoms, and n is from 1 to 10, —Si—$_n$ where n is from 1 to 10, a phenylene repeating group having from 1 to 10 units.

6. An iodonium salt, comprising:

a compound having the formula



or the formula



where n of $(R)_n$ is from 1 to 5,

where R can be benzo, a halo, an alkyl having from 1 to 20 carbon atoms, a cycloalkyl having from 4 to 20 carbon atoms, an aryl having from 6 to 40 carbon atoms, a halogen substituted aryl wherein said aryl has from 6 to 40 carbon atoms, a naphthyl, a halo substituted naphthyl, an alkyl substituted naphthyl wherein said alkyl has from 1 to 20 carbon atoms, a cycloalkyl substituted naphthyl wherein said cycloalkyl has from 3 to 20 carbon atoms, a hetero atoms substituent on an aryl with said aryl having from 6 to 40 carbon atoms, said hetero atom selected from the group consisting of CN, NO_2, COOH, CHO, OH, an alkoxy having from 1 to 5 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof; a pyridinyl, alpha or beta furyl, alpha or beta thienyl, and combinations thereof;

wherein said R′ is hydrogen, an alkyl having from 1 to 20 carbon atoms, a halogen substituted aryl wherein said aryl has from 6 to 40 carbon atoms, a hetero atoms substituent substituted on an aryl having from 6 to 40 carbon atoms, said hetero atom substituent selected from the group consisting of CN, NO_2, COOH, CHO, an alkoxy having from 1 to 6 carbon atoms, an aryloxy having 6 to 30 carbon atoms, and combinations thereof;

wherein Y is hydrogen, an alkyl having from 1 to 5 carbon atoms, an aryl having from 6 to 12 carbon atoms, a halo, and a hetero group selected from the group consisting of NO_2, CN, COOH, CHO, OH, and combinations thereof;

wherein X is O, NH, S,

Sn, SO, SO_2, a ketone group, N—R''' where R''' is an alkyl having from 0 to 5 carbon atoms or an aryl having from 6 to 12 carbon atoms, $—CH_2—_n$ where n is from 0 to 10, —CR'$_2$—C where R' is an alkyl having from 0 to 5 carbon atoms, —C aryl (n) wherein said aryl has from 6 to 12 carbon atoms, and n is from 1 to 10; a —SiR'''$_{2(n)}$ where said R''' is an alkyl having from 0 to 5 carbon atoms or an aryl having from 6 to 12 carbon atoms, and n is from 1 to 10, $—Si—_n$ where n is from 1 to 10, a

wherein n is from 1 to 10 units, a phenylene repeating group having from 1 to 10 units.

4,513,138

CAMPTOTHECIN-1-OXIDE DERIVATIVES

Tadashi Miyasaka, Kanagawa; Seigo Sawada, Tokyo; Kenichiro Nokata, Tokyo, and Masahiko Mutai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

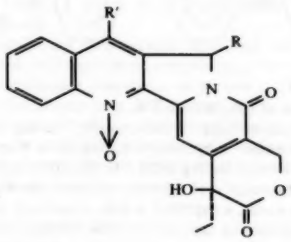
Filed Sep. 2, 1982, Ser. No. 414,528

Claims priority, application Japan, Sep. 4, 1981, 56-138412

Int. Cl.^{3} C07D *491/22*; A61K *31/47*

U.S. Cl. 546—48 **8 Claims**

1. A 5- or 7-substituted camptothecin-1-oxide derivative of the formula:



wherein R is a hydrogen atom, a straight or branched C_1–C_{30} alkyl group, a C_5–C_7 cycloalkyl group, a hydroxyl group, a C_1–C_{30} alkoxy group or a C_1–C_{18} acyloxy group and R^1 is a hydrogen atom, a C_1–C_{30} alkyl group, a phenylalkyl group, a naphthylalkyl group, a hydroxymethyl group, a C_1–C_{18} acyloxymethyl group or a carboxymethyl group, with the proviso that both R and R^1 are not hydrogen.

4,513,139

SUBSTITUTED LACTONES OF AMINO ACIDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and André Tèche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

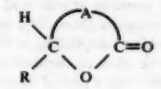
Division of Ser. No. 212,569, Dec. 3, 1980, Pat. No. 4,350,637. This application Jun. 30, 1982, Ser. No. 393,812

Claims priority, application France, Dec. 10, 1979, 79 30201

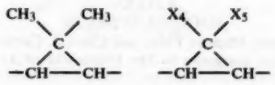
Int. Cl.^{3} C07D *405/04*

U.S. Cl. 546—196 **9 Claims**

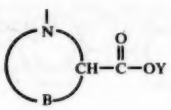
1. A substituted lactone of amino acids in all their possible stereoisomeric forms or mixtures of the formula



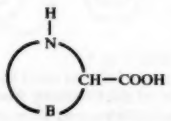
wherein A is selected from the group consisting of an aliphatic hydrocarbon of 2 to 3 carbon atoms optionally containing a double bond, a monocyclic hydrocarbon of 3 to 6 carbon atoms optionally containing one unsaturation, a bicyclic hydrocarbon of 5 to 10 carbon atoms optionally containing one unsaturation,



and X_4 and X_5 are individually selected from the group consisting of hydrogen, fluorine, chlorine, bromine and alkyl of 2 to 6 carbon atoms or taken together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 7 carbon atoms and R is



Y is derived from an alcohol selected from the group consisting of primary aliphatic alcohols of 1 to 12 carbon atoms, primary cycloaliphatic alcohols of 4 to 8 carbon atoms and benzyl alcohol and B is the remainder of a heterocyclic amino acid of the formula



having a total of 3 to 6 carbon atoms in the acid.

4,513,140

2-AMINO-4,5-DIHYDRO-1H-IMIZOLE-1-CARBOXANILIDES

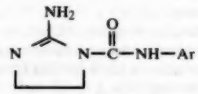
Leonard R. Hecker, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Division of Ser. No. 316,601, Oct. 30, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 514,541

Int. Cl.^{3} C07D *233/46*

U.S. Cl. 548—315 **1 Claim**

1. A process for preparing an acid addition salt of a compound of the following formula (I) which is stable to rearrangement



(I)

wherein

Ar is phenyl substituted with from 0 to 3 substituents independently selected from the group consisting of fluoro, chloro, bromo, methyl, ethyl, methoxy, ethoxy, trifluoromethyl and methylthio, which comprises:

(i) reacting 2-iminoimidazolidine with an appropriate aryl isocyanate of the formula ArNCO at a temperature of about −10° to −20° C.;
(ii) reacting the free base resulting from step (i) with an appropriate acid; and
(iii) isolating the acid addition salt product of step (ii).

4,513,141

METHOD FOR MAKING AROMATIC ETHERS USING DIORGANOAMINO PYRIDINUM SALT CATALYST

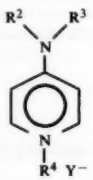
Daniel J. Brunelle, Scotia, N.Y., and Daniel A. Singleton, Minneapolis, Minn., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,689

Int. Cl.³ C07B *29/00*; C07D *207/444*; C07C *41/01*

U.S. Cl. 548—476 **18 Claims**

1. In the method for making an aromatic ether comprising the reaction between a nuclear activated aromatic compound substituted with a leaving group selected from a nitro or halo radical and an alkali metal phenoxide in the presence of a phase transfer catalyst, the improvement which comprises utilizing as the phase transfer catalyst a diorganoaminopyridinium salt of the formula,



where R^2 and R^3 are monovalent or divalent organo radicals selected from $C_{(1-13)}$ hydrocarbon radicals and $C_{(1-13)}$ substituted hydrocarbon radicals and $C_{(1-8)}$ divalent alkylene radicals which can be part of a cyclic structure forming a $C_{(4-12)}$ ring, R^4 is selected from $C_{(4-18)}$ linear or branched alkyl radicals and Y is a counter ion.

4,513,142

PREPARATION OF CATIONIC METHINE DYESTUFFS

Roderich Raue; Volker Hühne, and Hans-Peter Kühlthau, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

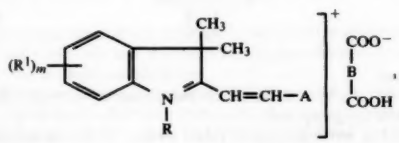
Filed Aug. 30, 1982, Ser. No. 412,644

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136583

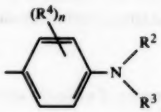
Int. Cl.³ C09B *23/00*

U.S. Cl. 548—507 **6 Claims**

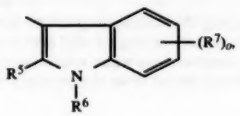
1. In the preparation of a dyestuff of the formula



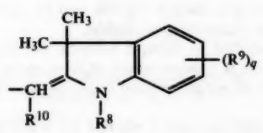
wherein
R represents an alkyl radical having 1 to 4 C atoms and which is optionally substituted by hydroxyl, alkoxy having 1 to 4 C atoms, acyloxy, halogen, cyano, carboxyl, C_1–C_4-carbalkoxy, carboxamido or acetyl,
R^1 represents hydrogen, an alkyl radical having 1 to 4 C atoms, halogen, alkoxy having 1 to 4 C atoms, hydroxyalkoxy having 2–4 C atoms, a phenoxy radical which is optionally substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, benzyloxy, benzyl, carboxyl, an alkyl carboxylate having 1 to 4 C atoms, a carboxamide group optionally substituted by 1 or 2 C_1–C_4-alkyl radicals, a sulphonamide group optionally substituted by 1 or 2 C_1–C_4-alkyl radicals, alkylsulphonyl having 1 to 4 C atoms, phenylsulphonyl or a cyano, trifluoromethyl, acetyl or benzoyl group, and
A represents a radical of the formula



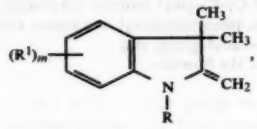
in which
R^2 and R^3 independently of one another represent an alkyl radical having 1 to 4 C atoms and which is optionally substituted by hydroxyl, C_1–C_4-alkoxy, halogen, cyano, phenyl, carbalkoxy having 1 to 4 C atoms, carboxamide, acyloxy, benzyloxy, sulphonamido or acylamino,
R^2 additionally also represents a phenyl or benzyl radical which is optionally substituted by halogen, C_1–C_4-alkyl or C_1 to C_4-alkoxy or R^2, together with the adjacent C atom of the benzene ring, can form a partially hydrogenated N- and, if appropriate, O-containing 5- or 6-ring, and
R^4 denotes hydrogen, an alkyl radical having 1 to 4 C atoms, an alkoxy radical having 1 to 4 C atoms or halogen,
or a radical of the formula



in which
R^5 denotes an alkyl radical having 1 to 4 C atoms, a pheny radical optionally substituted by halogen, C_1- to C_4-alkyl or C_1- to C_4-alkoxy or a carbalkoxy radical having 1 to 4 C atoms,
R^6 denotes hydrogen or an alkyl radical having 1 to 4 C atoms and which is optionally substituted by hydroxyl, halogen, alkoxy having 1 to 4 C atoms, cyano or acyloxy and
R^7 denotes hydrogen, halogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy, carbalkoxy having 1 to 4 C atoms, C_1- to C_4-alkylsulphonyl, phenylsulphonyl, acetyl or benzoyl or a radical of the formula



wherein
R^8 and R^9 independently of one another have the same meaning as R and R^1,
R^{10} designates hydrogen or the cyano group, B represents a single bond or a C_1- to C_4-alkylene radical which is substituted by hydroxyl radicals and which is optionally substituted by one additional carboxyl group and the indices m, n, o and p independently of one another denote 1–4, by reacting a methyleneindoline compound of the formula



with an equimolar amount of an aldehyde of the formula

A—CHO

and with 1 to 5 times the molar amount of a dicarboxylic or tricarboxylic acid of the formula

wherein B is as defined above, the improvement which comprises effecting the reaction in the substantial absence of a solvent and removing water formed in the reaction.

4,513,143

PREPARATION OF KETENE ACETALS

Steven Y. Ng, San Francisco; Donald W. Penhale, Cupertino, and Jorge Heller, Woodside, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Dec. 1, 1982, Ser. No. 445,938
Int. Cl.³ C07D *319/00*
U.S. Cl. 549—335 **8 Claims**

1. A process for rearranging allyl acetals to produce ketene acetals which comprises intimately mixing an allyl acetal with an alkali metal lower alkyl dissolved in a water soluble primary amine and recovering a ketene acetal from the resultant mixture.

4,513,144

ACETAL PURIFICATION WITH SUPEROXIDES

Jeff T. Fenton, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 3, 1982, Ser. No. 438,672
Int. Cl.³ C07D *323/06*
U.S. Cl. 549—368 **10 Claims**

1. A method for purifying acetals comprising
(1) placing said acetals into a molten state,
(2) contacting molten acetals with alkali metal superoxides under substantially anhydrous conditions for a time sufficient to reduce impurities present, and
(3) recovering the purified acetal.

5. A method as described in claim 1 wherein step 2 is carried out in the presence of a phase transfer catalyst.

6. A method as described in claim 5 wherein the phase transfer catalyst is present in concentrations of from about 0.1 weight percent to about 10 weight percent based on the acetal present.

7. A method as described in claim 6 wherein the acetal is at least one material selected from the group consisting of trioxane, tetraoxane, 1,3-dioxane, 3-dioxane 4-methyl-1,3-dioxolane, 1,3-dioxolane, 1,3,6-trioxacyclooctane, 1,4-butane-diolformal, 1,4-butenediolformal, methoxymethylal, methylal and dimethoxymethylal.

8. A method as described in claim 7 wherein the phase transfer catalyst is at least one crown ether selected from the group consisting of 15-crown-5-ether, 18-crown-6-ether, dibenzo-18-crown-6 ether, dicyclohexyl-18-crown-6-ether, benzo-15-crown-5-ether, alkyl-18-crown-6-ether, alkyl-2,2,2-cryptate ether, benzo-2,2,2-cryptate, 2,2,2-cryptate, 2,2,1-cryptate, 2,1,1-cryptate, dibenzo-24-crown-6, and 12-crown-4.

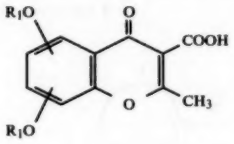
4,513,145

2-METHYLCHROMONE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Shigeto Negi; Seiichiro Nomoto; Takashi Kamiya; Yoshimasa Machida; Isao Saito, and Kyosuke Kitoh, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1983, Ser. No. 457,394
Claims priority, application Japan, Dec. 28, 1982, 57-232443
Int. Cl.³ C07D *311/22*
U.S. Cl. 549—402 **4 Claims**

1. A 2-methylchromone derivative represented by the general formula:



wherein R_1 means a hydrogen atom or a lower alkanoyl group.

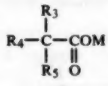
4,513,146

METHOD FOR PRODUCING ESTERS FROM HIGHLY HINDERED CARBOXYLIC ACIDS OR THEIR SALTS, AND CARBONATES

Ralph B. Thompson, Oakbrook, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1982, Ser. No. 422,221
Int. Cl.³ C07C *69/02*
U.S. Cl. 560—231 **30 Claims**

1. A method comprising reacting highly hindered carboxylic acid or salt thereof represented by the formula



wherein
a. R_3, R_4, and R_5 are each independently a monovalent organo group, and
b. M is hydrogen, monovalent metal, or the monovalent fractional part of a polyvalent metal,
with organic carbonate represented by the formula

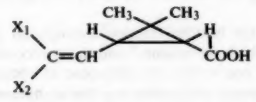
wherein R_1 and R_2 are each independently monovalent organic groups which may be the same or different, and wherein the alpha carbon of at least one of R_1 and R_2 is substantially sterically unhindered, to produce carboxylic acid ester.

4,513,147
PROCESS FOR PREPARING CIS-3-(2,2-DIHALOVINYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLIC ACID

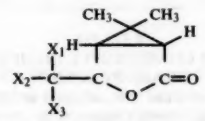
Jacques Martel, Bondy; Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-sous-Bois, and Jean Jolly, Fontenay-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 027,654, Apr. 6, 1979, Pat. No. 4,281,182, which is a division of Ser. No. 914,399, Jun. 12, 1978, Pat. No. 4,166,063. This application Mar. 30, 1981, Ser. No. 248,719
Claims priority, application France, Jun. 27, 1977, 77 19612
Int. Cl.³ C07C *69/743*
U.S. Cl. 562—506 6 Claims

1. A process for the preparation of cis 2,2-dimethylcyclopropane-1-carboxylic acid of the formula



wherein X_1 and X_2 are both chlorine or bromine and when different are selected from the group consisting of fluorine, bromine and chlorine comprising reacting a compound of the formula



wherein X_1, X_2 and X_3 when identical are selected from the group consisting of chlorine and bromine and when at least two are different, are selected from the group consisting of fluorine, chlorine and bromine with a reducing agent to eliminate the X_3 substituent which is the halogen with the higher atomic weight.

4,513,148
METHOD FOR THE PREPARATION OF METHYLNITRAMINE

George W. Nauflett, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1982, Ser. No. 394,084
Int. Cl.³ C07C *111/00*
U.S. Cl. 564—109 12 Claims

1. A process for the production of methylnitramine comprising:

(a) preparation of 1,3-dimethyl-1,3-dinitrourea using a mixture of nitric and sulfuric acid and dimethylurea to yield the nitrated dimethyiurea;

(b) separation of 1,3-dimethyl-1,3-dinitrourea from the spent acids (used) after the nitration step has been completed by the use of an organic solvent selected from the group consisting of chloroform and methylene chloride;

(c) purification of 1,3-dimethyl-1,3-dinitrourea by washing with an aqueous solution contain an organic bottom phase that yields a two phase mixture with nitrated product in the bottom phase;

(d) taking the bottom phase and mixing this phase with hot water to yield a two phase mixture;

(e) removal of the bottom phase from step d that contains dimethyl dinitrourea in the organic solvent;

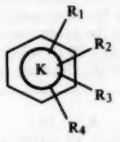
(f) hydrolysis of the dimethyldinitrourea in the organic solvent wth hot water to yield methylnitramine.

4,513,149
RANEY NICKEL ALLOY EXPANDED MESH HYDROGENATION CATALYSTS

Thomas J. Gray, Guilford, and Norman G. Masse, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 5, 1982, Ser. No. 365,210
Int. Cl.³ C07C *85/24, 85/00*
U.S. Cl. 564—449 40 Claims

1. In a method for hydrogenating an aromatic ring compound of the type



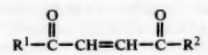
wherein K is either benzene or napththalene, R_1 is hydrogen atom or an aliphatic chain containing from about 1 to about 9 carbon atoms or a phenyl radical, R_2 is a hydrogen atom or an aliphatic chain containing from about 1 to about 3 carbon atoms, and R_3 and R_4 are hydrogen atoms, hydroxy, or nitro groups in the presence of catalyst, said catalyst comprising a structure comprised of a Raney metal alloy surface layer integral with and derived from a selected nickel alloy monolithic substrate mesh structure, wherein said surface layer is predominantly derived from an adherent $Ni_xM_{1-x}Al_3$ Beta phase structured crystalline precursory layer, where M is a catalytic activator selected from the group consisting of molybdenum, titanium, tantalum, ruthenium or mixtures thereof, and where x, the fraction of nickel in combined weight of Ni and M, is within the range of from about 0.80 to about 0.95.

4,513,150
PREPARATION OF BUT-2-ENE-1,4-DIONES SUBSTITUTED IN THE 1,4-POSITIONS

Rolf Fischer, Heidelberg; Hans-Martin Weitz, Bad Durkheim, and Hardo Siegel, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

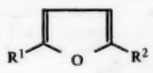
Filed Mar. 23, 1984, Ser. No. 592,908
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311320
Int. Cl.³ C07C *45/59*
U.S. Cl. 568—385 6 Claims

1. A process for the preparation of a but-2-ene-1,4-dione substituted in the 1,4-positions, of the formula



I

where R^1 and R^2 are each an aliphatic hydrocarbon radical of 1 to 17 carbon atoms, by oxidizing a 2,5-disubstituted furan of the formula



II

where R^1 and R^2 have the above meaning, wherein the oxidation is carried out using an aliphatic percarboxylic acid and in the presence of an aliphatic carboxylic acid at from 0° to 200° C.

4,513,151
ACETALDEHYDE PROCESS

Richard W. Wegman, South Charleston, and David C. Busby, Cross Lanes, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

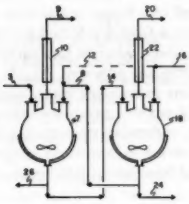
Filed Dec. 2, 1983, Ser. No. 557,271
Int. Cl.³ C07C *45/49, 45/50*
U.S. Cl. 568—484 **24 Claims**

1. A process for the reaction of an inorganic or organic ester with carbon monoxide or synthesis gas at a temperature of from 100° C. to 300° C., a pressure of from 500 psig to 10,000 psig, a H_2:CO mole ratio in the synthesis gas of from 1:10 to 10:1, in contact with an Me homogenous catalyst system containing lithium iodide as the promoter, wherein the mole ratio of LiI:Me is from 50:1 to 1:50 to selectively produce an aldehyde, wherein Me is cobalt, rhodium or ruthenium.

4,513,152
CHLORAL PURIFICATION

Richard D. Schillawski, Boulder City, Nev., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 3, 1983, Ser. No. 538,698
Int. Cl.³ C07C *45/80*
U.S. Cl. 568—492 **30 Claims**



1. A process for purifying wet crude chloral using sulfuric acid in a plurality of contacting operations wherein the contacting and separating are conducted at a temperature above about 50° C. comprising:

(a) contacting the crude wet chloral with a sulfuric acid solution having a concentration necessary to produce two liquid phases wherein the sulfuric acid solution forms the top phase after agitation;

(b) separating the phases obtained in (a) by physical means;

(c) contacting the chloral recovered in (b) with a more concentrated sulfuric acid solution to obtain the dried product; and

(d) countercurrently cycling sulfuric acid solution recovered from (c) to (a) to purify subsequent crude chloral.

4,513,153
INTEGRATED PROCESS FOR PRODUCING TERT.BUTYL ALKYL ETHERS AND BUTENE-1

Romedio Sandrin, Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Filed May 3, 1983, Ser. No. 491,067
Claims priority, application Italy, May 20, 1982, 21383 A/82
Int. Cl.³ C07C *41/06*
U.S. Cl. 568—697 **5 Claims**

1. An integrated process for producing tert-butyl alkyl ethers and butene-1 from a C_4 hydrocarbon feedstock optionally containing C_3 and C_5 components and non-hydrocarbon components, the butadiene having been previously separated from said feedstock, comprising

(a) feeding the C_4 hydrocarbon feedstock which is substantially free of butadiene to a tert-butyl alkyl ether synthesis section which is filled with a catalyst constituted by an acid ion exchange resin,

(b) reacting the isobutene contained in the C_4 hydrocarbon feedstock with an aliphatic alcohol in order to produce a tert-butyl alkyl ether,

(c) separating the tert-butyl alkyl ether from the residual C_4 hydrocarbons by distillation,

(d) subjecting the residual C_4 hydrocarbons to extractive distillation in the presence of a solvent in order to separate most of the C_4 saturated hydrocarbons and the lighter hydrocarbons (C_3) present as an overhead product from a bottom product which is an extract comprising the solvent, butene-1, butene-2, the remainder of the C_4 saturated hydrocarbons and the heavy hydrocarbons (C_5+),

(e) then subjecting the extract to stripping in order to separate the solvent from the remainder of the extract,

(f) recycling the solvent to the extractive distillation,

(g) distilling the remainder of the extract to give an overhead fraction constituted by butene-1 and a bottom fraction comprising butene-2 and butene-1 and the balance of the extract,

(h) passing the bottom fraction through an isomerization stage in which the butene-2 and the unrecovered butene-1 are partly converted into isobutene to obtain an isomerized hydrocarbon fraction containing butene-1, butene-2 and isobutene,

(i) separating said isomerized hydrocarbon fraction from the remainder of the products, and

(j) feeding the isomerized hydrocarbon fraction containing butene-1, butene-2 and isobutene to the tert-butyl alkyl ether synthesis.

4,513,154
PROCESS FOR CONSECUTIVE COMPETITIVE GAS PHASE REACTION

Bruce E. Kurtz, Marcellus, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 46,987, Jun. 8, 1979, abandoned, which is a division of Ser. No. 644,788, Dec. 29, 1975, Pat. No. 4,187,235, which is a continuation-in-part of Ser. No. 363,445, May 24, 1973, abandoned, which is a division of Ser. No. 167,733, Jul. 30, 1971, abandoned. This application Jul. 28, 1980, Ser. No. 172,725
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.³ C07C *17/00*
U.S. Cl. 570—145 **21 Claims**

1. A process for suppression of partially halogenated intermediates in isothermal consecutive competitive gas phase reaction which comprises:

a. passing a first gas feed stream containing a carbon compound having labile hydrogen selected from the group consisting of straight and branched chain cyclic and acyclic alkanes and alkenes having no more than 12 carbon atoms, benzenes, alkenylbenzenes and alkylbenzenes having no more than 9 carbon atoms, their partially reacted intermediates and mixtures thereof under pressure into one end of a first elongated gas zone positioned within a substantially gas-impervious barrier;

b. passing a second gas stream containing a member selected from the group consisting of F_2, Cl_2 and Br_2 under pres-

sure into a second elongated gas zone positioned along said first zone, said first and second elongated gas zones being separated along the major length thereof by a porous member;

c. maintaining the pressure of the second gas stream in the second gas zone in excess of the pressure in the first gas zone to allow flow of said second gas through the porous member;

d. maintaining a Reynolds number N_{Re} for stream in the first gas zone at a non-zero value less than about 2,000 to effect consecutive-competitive reaction between the first gas and the second gas, in a reaction film on the surface of the porous member facing the first zone for production of more highly halogenated product and to suppress diffision of partially halogenated intermediates from said reaction film wherein the Reynolds number,

$$N_{Re} = \frac{4\bar{A}v\rho}{P\mu}$$

wherein

A = cross-sectional area of the first gas zone;

P = total length of the perimeter of the cross-sectional area of first gas zone;

v = average velocity of the gas stream in the first gas zone;

ρ = density of the gas stream in the first gas zone;

μ = viscosity of the gas in the first gas zone; and

e. withdrawing a gas stream containing the halogenated product from the other end of the first gas zone.

4,513,155
LUBRICATING OIL FOR DIESEL ENGINES

Kunimitsu Tamura, Saitama, and Kunihiko Hosonuma, Tokyo, both of Japan, assignors to Nippon Mining Co., Ltd. and Mitsui Engineering & Shipbuilding Co., Ltd., both of, Japan

Filed Jun. 24, 1983, Ser. No. 507,386

Claims priority, application Japan, Jun. 24, 1982, 57-108769

Int. Cl.³ C10M *1/16*

U.S. Cl. 585—13 **22 Claims**

1. A lubricating oil for a trunk piston type diesel engine which reduces the wear of a piston ring of the engine and the clogging of a filter of lubricant purifier comprising a mixture of (A) a lubricating mineral base oil and (B) a highly aromatic light lubricating base oil, wherein said highly aromatic light lubricating base oil (B) has an aromaticity $fa \geqq 0.22$ wherein fa is an aromatic hydrocarbon distribution parameter, has a boiling point of about 270° to 450° C. as calculated at 1 atm., is at least one selected from the group consisting of alkylbenzenes, alkylnaphthalenes and alkylbiphenyls, and is present in said lubricating oil in an amount in the range of about 5 to 40 vol %, and said lubricating oil has a dynamic viscosity of 7 to 18 cSt at 100° C.

4,513,156
OLEFIN OLIGOMERIZATION USING EXTRACTED FEED FOR PRODUCTION OF HEAVY HYDROCARBONS

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,699

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—329 **10 Claims**

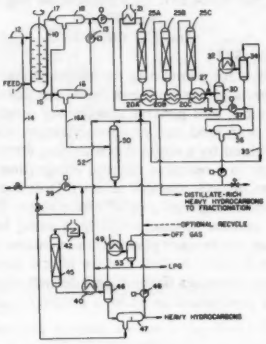
1. A process for converting olefins to heavier liquid hydrocarbons comprising

contacting an olefinic liquid hydrocarbon feedstream containing oxygenated hydrocarbons with a polar solvent under liquid extraction conditions and recovering a polar extract phase containing the oxygenated hydrocarbons and an olefinic liquid raffinate stream substantially free of oxygenated hydrocarbons;

contacting the olefinic liquid stream in a first catalyst reactor zone with oligomerization catalyst at elevated pressure and moderate temperature under conditions favorable for conversion of olefins to a first reactor effluent stream rich in distillate range hydrocarbons;

flashing the distillate-rich stream and separating the first reactor effluent stream into a liquid product stream rich in distillate and a vapor stream containing lower hydrocarbons;

separating oxygenated hydrocarbons from the polar extract phase; and



contacting at least a portion of the vapor stream from the flashing step and recovered oxygenated hydrocarbons in a second catalyst reactor zone with oligomerization catalyst at moderate pressure and elevated temperature under conditions favorable for conversion of lower olefins and oxygenates to a second reactor effluent stream rich in heavier hydrocarbons.

4,513,157
ISOMERIZATION OF ISOLATED DOUBLE BONDS TO CONJUGATED DOUBLE BONDS IN OPTIONALLY SUBSTITUTED CYCLOOCTADIENES

Peter Hänssle, Haltern, and Wolfgang Zaar, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,695

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325268

Int. Cl.³ C07C *5/24*

U.S. Cl. 585—378 **17 Claims**

1. In a process for the isomerization of isolated double bonds to conjugated double bonds in optionally substituted cyclooctadienes using an isomerization catalyst, optionally in the presence of a solvent, the improvement wherein said isomerization catalyst comprises:

(a) a transition metal compound of the formula $Me(OR^1)_4$, wherein Me is Ti, Zr, or Hf, and R^1 and C_{1-4} alkyl; and

(b) an organoaluminum compound of the formula $AlR^2_{3-n}X_n$, wherein R^2 is C_{1-4} alkyl, n is 0, 1, 2 or a fraction between 1 and 2, and X is halogen, or when n is 1, X is halogen or hydrogen;

the molar ratio of (a):(b) being from 0.1:1 to 1:1.

4,513,158

POLYMERIZATION AND OLIGOMERIZATION WITH CATALYTICALLY ACTIVE AMORPHOUS SILICA

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 533,199, Sep. 16, 1983, , which is a continuation-in-part of Ser. No. 526,866, Aug. 25, 1983, Pat. No. 4,481,102, which is a division of Ser. No. 356,351, Mar. 9, 1982, Pat. No. 4,414,137. This application Sep. 10, 1984, Ser. No. 649,226

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—527 **25 Claims**

1. A process for promoting the oligomerization of a hydrocarbon compound containing at least one unsaturated carbon to carbon bond, said process comprising contacting said hydrocarbon compound under oligomerization conditions with a catalyst prepared by a method comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions and an organic reactant selected from the group consisting of amines having a pK_a value above about 10.0, quaternary ammonium cations having a nitr_gen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

4,513,159

ACETYLENE REMOVAL PROCESS

Cecil G. McFarland, League City, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 540,336, Jan. 13, 1975, abandoned, which is a division of Ser. No. 443,752, Feb. 19, 1974, abandoned. This application Oct. 12, 1979, Ser. No. 84,295

Int. Cl.³ C07C *7/00*

U.S. Cl. 585—625 **4 Claims**

1. In a vapor phase process for the preparation of unsaturated hydrocarbon monoolefins and diolefins comprising oxidative dehydrogenation of a stream of C_3 to C_9 hydrocarbon compounds to produce a product stream comprising 3.5 to 80 mol percent of unsaturated hydrocarbon product and of about or from 0.0001 to 2.5 mol percent acetylenic compound impurity, about or from 0.0005 to 2.5 mol percent carbonyl compounds and 5 to 93 mol percent non-condensable gases, wherein the improvement comprises contacting said product stream in vapor phase at a temperature in the range of 250° to 900° C. and containing less than 5 mol percent free oxygen with a solid catalyst for reducing said acetylenic compounds in said product stream, said catalyst consisting essentially of oxides, carbonates or hydroxides of Fe, Ni and Zn, wherein Fe is the major metal component, an alkaline earth metal oxide, carbonate or hydroxide of Mg, Ca, Sr or Ba, and about 0.5 to 30 weight percent of an alkali metal oxide, carbonate or hydroxide of Li, Na, K or Rb determined as metal and based on the other metallic elements, said Ni being present in the range of 0.25 to 20 weight percent of the total weight of the catalyst, and

recovering said stream having the amount of acetylenic compounds therein reduced.

4,513,160

PROCESS FOR THE CONVERSION OF ALCOHOLS AND OXYGENATES TO HYDROCARBONS IN A TURBULENT FLUID BED REACTOR

Amos A. Avidan, Mantua, and Anthony Y. Kam, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,521

Int. Cl.³ C07C *1/00, 1/20*

U.S. Cl. 585—640 **3 Claims**

1. A process for converting methanol, dimethylether or mixtures thereof to a gasoline-rich product containing at least about 70% of a hydrocarbon product higher boiling than the reactant comprising the steps of passing the reactant upwardly in a catalytic reactor through a fluidized bed of catalyst particles comprising ZSM-5 crystalline zeolite under conditions effective to provide turbulent regime fluidization, said catalyst particles having a particle density of about 0.9 to about 1.6 g/cc, an average catalyst particle size of about 40 to about 80 μm including about 5 to 40 weight percent of catalyst fines having a particle size less than 40 μm; and wherein effective conditions include a superficial fluid velocity of about 0.5 to about 7 fps, a pressure of about 15 to about 100 psia and a catalyst bed height of more than 8 feet, thereby converting more than 95 percent of the reactant in the reactor.

4,513,161

CONVERSION OF METHANOL TO HYDROCARBONS

Charles H. Mauldin, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1984, Ser. No. 626,025

Int. Cl.³ C07C *1/00*

U.S. Cl. 585—640 **9 Claims**

1. A process useful for the conversion of methanol to hydrocarbons which comprises contacting at reaction conditions a feed comprised of an admixture of methanol and hydrogen, in methanol:hydrogen molar ratio equal to or greater than about 2:1 at total pressure equal to or greater than about 160 psig, over a catalyst which comprises ruthenium in catalytically active amount composited with titania or titania-containing support.

4,513,162

DEHYDROGENATION PROCESS

Ghazi R. Al-Muddarris, Surrey, England, assignor to Davy McKee Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 409,090, Aug. 18, 1982, abandoned. This application Jan. 6, 1984, Ser. No. 568,523

Claims priority, application United Kingdom, Aug. 18, 1981, 8125140

Int. Cl.³ C07C *5/34*

U.S. Cl. 585—654 **14 Claims**

1. A continuous process for dehydrogenating an alkane comprising:

providing an admixture of said alkane with steam

contacting a plurality of at least three groups of dehydrogenation catalyst containing tubes with a heating medium within a single furnace chamber of a fired reactor;

feeding the admixture to common headers for each group of the catalyst containing tubes;

contacting the admixture with the catalyst in the groups of tubes in the fired tubular reactor under endothermic dehydrogenating conditions;

cyclically shutting off in turn a minority of the groups of tubes from alkane flow for reactivation, the ratio of the number of groups of tubes operating under dehydrogenating conditions to the number of groups of tubes undergoing reactivation having been determined as a function of the rate of catalyst deactivation;

admitting a reactivating medium to said minority of groups of tubes to cause exothermic reactivation of the catalyst, whereby the ctalyst in each minority of groups of tubes is cyclically reactivated during the process; and

admixing the effluents from all the tubes, including both tubes operating under dehydrogenating conditions and tubes operating under reactivation conditions, to form a common effluent stream.

4,513,163
CONVERSION OF AROMATICS TO ISO-PARAFFINS USING A $NaALCl_4/HALCl_4$ MOLTEN SALT CATALYST SYSTEM

Mark A. Plummer, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 30, 1983, Ser. No. 567,194
Int. Cl.³ C07C 5/27
U.S. Cl. 585—700 **14 Claims**

1. A process for producing iso-paraffins from aromatic hydrocarbons comprising contacting said aromatic hydrocarbons with a molten mixture comprising $NaAlCl_4$ and from about 0.5 to about 25 weight percent $HAlCl_4$ at a temperature sufficient to maintain the molten state of said mixture.

4,513,164
CONDENSATION OF NATURAL GAS OR METHANE INTO GASOLINE RANGE HYDROCARBONS

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Division of Ser. No. 504,738, Jun. 16, 1983, Pat. No. 4,467,130, which is a division of Ser. No. 298,486, Sep. 1, 1981, Pat. No. 4,433,192. This application Feb. 14, 1984, Ser. No. 579,947
Int. Cl.³ C07C 7/44
U.S. Cl. 585—700 **4 Claims**

1. A process for the direct heterogeneous catalytic gas-phase oxidative conversion of natural gas or methane into gasoline-range hydrocarbons by reacting natural gas or methane in the presence of an oxidizing agent comprised of air, oxygen-ozone mixture, sulfur, selenium, sulfur trioxide, nitrogen oxides or a halogen in the presence of a superacid catalyst having a Hammett activity function H_o of less than -11.9.

4,513,165
ALKYLATION PROCESS

Joe Van Pool, c/o Ste. 1107, 1825 K St., NW., Washington, D.C. 20006

Filed Jun. 15, 1984, Ser. No. 620,787
Int. Cl.³ C07C 2/58
U.S. Cl. 585—723 **10 Claims**

1. A process for the acid-catalyzed alkylation of an isoparaffin with an olefin to produce an alkylate product which comprises the steps of

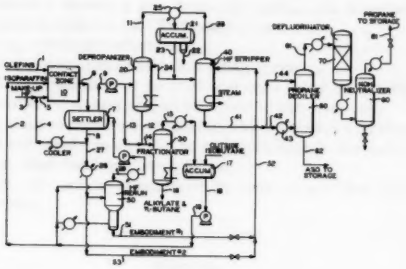
(a) reacting an isoparaffin with an olefin in the presence of hydrogen fluoride alkylation catalyst in a reaction zone,

(b) separating a hydrocarbon phase and a catalyst phase comprising HF acid and acid soluble oils (ASO) from step (a),

(c) passing said hydrocarbon phase to a fractionation zone operated at conditions selected to separate a vaporous overhead stream comprising HF acid and light paraffins, and a bottoms stream comprising alkylate product,

(d) cooling and condensing said vaporous overhead and separating the condensate formed into a hydrocarbon phase and a HF acid phase which can be recycled to said reaction zone in (a),

(e) passing at least a portion of said hydrocarbon phase in (d) as reflux to said fractionation in (c) and the remainder to HF acid stripping zone operated at conditions selected to withdraw overhead a stream comprising HF acid and a



bottoms stream comprising light paraffin and acid soluble oils (ASO),

(f) separating said bottoms stream in (e) into a light paraffin stream and an acid soluble oils stream (ASO), and

(g) passing at least a potion of said catalyst phase in (b) as a portion of the feed to said HF-acid stripping zone in (e).

4,513,166
PROCESS FOR THE LOW POLYMERIZATION OF ISOBUTENE

Satoshi Sakurada, Omiya; Takao Hashimoto, Saitama; Nobuaki Tagaya, Kawagoe; Tsugio Maeshima, Saitama; Kayako Ueda, Tokyo, and Masahiro Kokubo, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

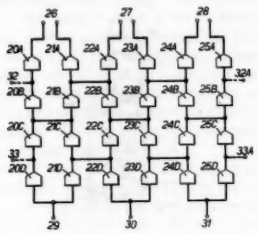
Division of Ser. No. 476,015, Mar. 15, 1983, Pat. No. 4,454,367. This application Apr. 6, 1984, Ser. No. 597,821
Claims priority, application Japan, Mar. 23, 1982, 57-44684; Mar. 26, 1982, 57-47316
Int. Cl.³ C07C 7/01
U.S. Cl. 585—832 **1 Claim**

1. A method of purifying 1-butene containing isobutene, which comprises contacting an isobutene-containing hydrocarbon mixture with a solid acid catalyst having a solid acid quantity of 0.05 to 0.25 mmol/g.solid acid catalyst, represented by the adsorption of pyridine, thus selectively low-polymerizing isobutene and then separating the low polymers of isobutene from the 1-butene, said solid acid catalyst being a high silica mordenite having an SiO_2/Al_2O_3 mole ratio of 50 to 200.

4,513,167
ARRAYS OF POLARIZED ENERGY-GENERATING ELEMENTS

Aharon Brandstetter, Torrens, Australia, assignor to The Australian National University, Australia

PCT No. PCT/AU83/00045, § 371 Date Dec. 20, 1983, § 102(e) Date Dec. 20, 1983, PCT Pub. No. WO83/03925, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 18, 1983, Ser. No. 573,926
Claims priority, application Australia, Apr. 27, 1982, PF3735
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—244 **30 Claims**



1. An array of polarised energy-generating elements, the elements in the array being formed as a matrix having a plurality of rows of elements and a plurality of columns of elements, with the elements in each row and column being polarised in the same direction, characterised in that

(a) the positive pole of each element in each column is connected to the negative pole of the next adjacent element in the column;

(b) the positive pole of each second element in a column is connected to the positive pole of the corresponding element of one of the two adjacent columns; and

(c) the positive pole of each alternate second element in a column is connected to the positive pole of the corresponding element in the other of the two adjacent columns.

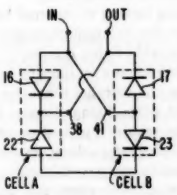
8. An array as defined in claim **1** further characterised in that there are an even number of columns in the array and the junctions between the alternate pairs of elements in the leftmost column of the matrix are connected, respectively, to the junctions between the alternate pairs of elements in the rightmost column of the matrix.

11. An array as defined in claim **8** in which each element is a battery.

4,513,168
THREE-TERMINAL SOLAR CELL CIRCUIT

Peter G. Borden, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 19, 1984, Ser. No. 602,033
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—244 **8 Claims**



1. A photovoltaic generator unit comprising a pair of photovoltaic cells, said cells adapted to receive incoming light from a given direction, each cell comprising, in electrical connection in the said direction:

a light-permeable first electrode,

a first semiconductive layer containing a photovoltaic junction having a high band-gap energy and a first polarity with respect to said direction,

a light-permeable second electrode,

a second semiconductive layer containing a photovoltaic junction having a low band-gap energy and a second polarity opposite said first polarity, and

a third conductive electrode;

said first polarities of said cells being opposite,

said first electrode of each of said cells being electrically connected to said second electrode of the other cell,

said third electrodes being electrically connected together,

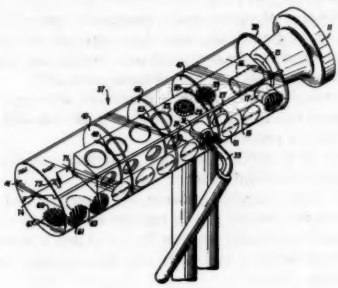
said low band-gap energies being approximately one-half of said high band-gap energies, and

means for external connection to each of said first electrodes.

4,513,169
TRANSFORMER BAR CONNECTOR COVER

Eugene W. McGrane, Ormond Beach, Fla., assignor to Homac Mfg. Company, Ormond Beach, Fla.

Filed Jul. 19, 1983, Ser. No. 515,237
Int. Cl.³ H01R *13/44*
U.S. Cl. 174—138 F **19 Claims**



10. An insulator cover for an elongated transformer bar connector having a plurality of spaced installation ports extending along the length thereof and extending therethrough at substantially right angles to the longitudinal axis of said bar connector, a plurality of internally threaded boreholes equal in number to said installation ports and extending from said ports to the exterior of said connector at substantially right angles to the axes of said ports, and a threaded borehole for a transformer stud locking screw, said cover comprising

an elongated housing closed at one end and open at the other end;

at least two substantially parallel longitudinally aligned rows of access ports through the wall of said housing, each of said access ports of one row being peripherally spaced from the access ports of the other row substantially ninety degrees;

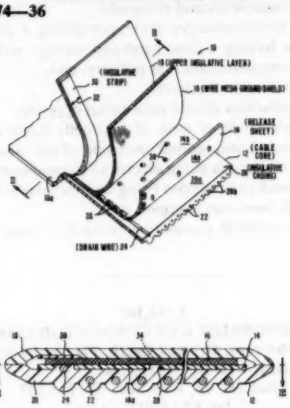
at least one alignment rib secured to and extending transversly within the interior of said housing;

aperture means in said alignment rib of a dimension to allow longitudinal passage of said connector bar therethrough while maintaining said cover in a substantially fixed position relative to said connector bar whereby said access ports will be aligned with said installation ports and boreholes in said bar connector when the cover is assembled thereon.

4,513,170
STRIPPABLE SHIELDED ELECTRICAL CABLE

Jeffrey S. Apodaca, Los Angeles, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Feb. 28, 1983, Ser. No. 470,663
Int. Cl.³ H01B *7/08, 11/06*
U.S. Cl. 174—36 **17 Claims**



1. A shielded electrical cable comprising:

a plurality of elongate, spaced electrical conductors;

a casing of electrically insulative material enclosing said conductors, at least one of said conductors having an exposed portion free of said casing material;

an electrically conductive shield member adheringly overlying said casing and in electrical contact with said exposed conductor portion;

a layer of electrical insulation adheringly overlying said conductive shield member; and

barrier means disposed between said layer and said exposed conductor portion and in registry exclusively with such exposed conductor portion for providing a non-adhered relation between said layer and said exposed conductor portion.

4,513,171
AERIAL CABLE TERMINAL

Louis Suffi, Westchester; James E. Golden, Evanston, and Donald F. Jaycox, Deerfield, all of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 14, 1983, Ser. No. 542,298
Int. Cl.³ H01R *9/00;* **H02G** *15/10*
U.S. Cl. 174—41 **20 Claims**

1. An aerial cable terminal, comprising:

an elongate housing, the housing including top and bottom walls, end walls and a back wall, and a dividing wall extending between said top and bottom walls to divide the interior of the housing into a back compartment and a front compartment, said housing being of unitary molded structure;

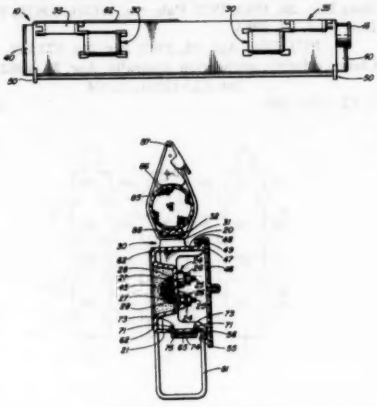
apertures in said dividing wall and a conductor terminal positioned in each aperture, each conductor terminal having a rear portion extending into said back compartment and a front portion extending into said front compartment;

said rear portion of each conductor terminal adapted for connection of a stub cable conductor thereto;

access means in one end wall for entry of a stub cable;

an operable front cover closing the front of said front compartment; and

support hangers extending up from an outer surface of said top wall, said support hangers comprising a first pair of hangers spaced apart along said top wall at positions intermediate the front and back walls and a second pair of hangers spaced apart along said top wall and having one side flush with the back surface of the housing, the hangers of said first pair displaced along the housing relative to

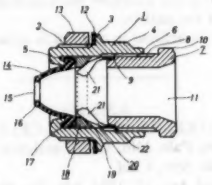


the hangers of said second pair, said second pair of hangers positioned symmetrically on said housing to be continguous with the second pair of hangers of a second terminal when two terminals are positioned back-to-back.

4,513,172
CLAMP FIXING DEVICE

Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

PCT No. PCT/JP81/00228, § 371 Date May 20, 1982, § 102(e) Date May 20, 1982, PCT Pub. No. WO82/01296, PCT Pub. Date Apr. 15, 1982
PCT Filed Sep. 9, 1981, Ser. No. 385,396
Claims priority, application Japan, Sep. 30, 1980, 55-136323; May 20, 1981, 56-72851[U]
Int. Cl.³ H02G *15/007*
U.S. Cl. 174—65 SS **8 Claims**



1. A cable fixing device comprising:

(a) an outer housing having an internal bore which is larger in diameter than the external diameter of any cable to be received in said cable fixing device;

(b) an inner housing having an internal bore which is larger in diameter than the external diameter of any cable to be received in said cable fixing device, said inner housing being threadedly received in said outer housing;

(c) a hanging bell-shaped packing mounted in the internal bore of said outer housing, said hanging bell-shaped packing having an axial hole sized and shaped to fit snugly around the periphery of a cable during use of said cable fixing device;

(d) a guiding ring slidably received in the internal bore of said outer housing and positioned to bear against said hanging bell-shaped packing, said guiding ring having an axial guiding hole which is larger in diameter than the

external diameter of any cable to be received in said cable fixing device and an axial camming surface on the end remote from said hanging bell-shaped packing;

(e) one of said hanging bell-shaped packing and said guiding ring having an axially protruding annular flange and the other of said hanging bell-shaped packing and said guiding ring having a corresponding annular recess sized, shaped, and positioned so as to receive said protruding annular flange, whereby said guiding ring fixes and holds said hanging bell-shaped packing; and

(f) a tightening ring slidably received in the internal bore of said outer housing, said tightening ring having a plurality of inwardly extending flexible fins sized and shaped to grip firmly the periphery of a cable during use of said cable fixing device, said tightening ring being positioned between said guiding ring and the axially inner end of said inner housing with the outer surface of said plurality of flexible fins bearing against the camming surface on said guiding ring and the axially inner end of said inner housing bearing against the end of said tightening ring remote from said guiding ring,

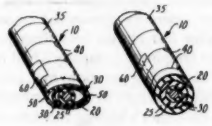
whereby, during use of said cable fixing device to clamp a cable, telescopic motion of said outer and inner housings relative to each other forces said tightening ring to slide axially in the internal bore of said outer housing, and the axial movement of said tightening ring causes the flexible fins on said tightening ring to be cammed inwardly by the axial camming surface on said guiding ring until the flexible fins firmly grip the periphery of the cable being clamped by said cable fixing device.

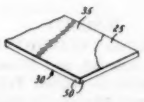
4,513,173

INTUMESCENT FIRE PROTECTIVE SHEATHS

Richard P. Merry, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 7, 1983, Ser. No. 501,887
Int. Cl.³ H01B 7/34, 13/06
U.S. Cl. 174—121 A **12 Claims**





1. An intumescent fire protective sheath for the protection of an electrical cable or conduit from the temperatures attainable from an open flame comprising:

a. at least one sheet of substantially inorganic intumescent fire protective material of a generally rectangular configuration having opposite major surfaces bound by four edge surfaces and capable of expansion generally only normal to the major surfaces, said sheet being loosely arranged around an electrical cable or conduit to abut adjacent edge surfaces and to form a generally fin-shaped protective layer spaced at least in part a distance from the electrical cable or conduit to permit dissipation of heat generated from within the electrical cable or conduit; and

b. high temperature resistant means for restraining the layer around the electrical cable or conduit, whereby the layer can essentially expand only generally inwardly towards the electrical cable or conduit and in the range of 2–4 times the average height of the edge surfaces so that cracking of the layer upon expansion is virtually eliminated.

10. A method of forming a fire protective sheath around an electrical cable or conduit comprising the steps of:

a. providing at least one sheet of substantially inorganic intumescent fire protective material of a generally rectangular configuration having opposite major surfaces bound by four edge surfaces and capable of expansion generally only normal to the major surfaces;

b. loosely arranging the sheet around the electrical cable or conduit and abutting adjacent edge surfaces to form a fin-shaped protective layer spaced at least in part a distance from the electrical cable or conduit to permit dissipation of heat generated from within the electrical cable or conduit; and

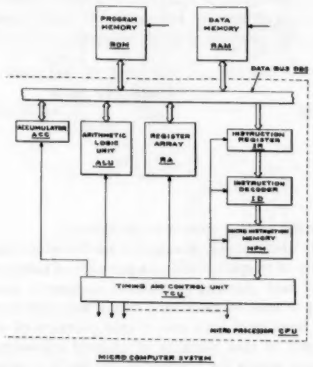
c. restraining the layer around the electrical cable or conduit with a high temperature resistant material, whereby the layer can expand generally only inwardly towards the electrical cable or conduit and in the range of 2–4 times the average height of the edge surfaces so that cracking of the layer upon expansion is virtually eliminated.

4,513,174

SOFTWARE SECURITY METHOD USING PARTIAL FABRICATION OF PROPRIETARY CONTROL WORD DECODERS AND MICROINSTRUCTION MEMORIES

Morton B. Herman, Huntington Station, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Mar. 19, 1981, Ser. No. 245,498
Int. Cl.³ H04L 9/00; G06F 5/00
U.S. Cl. 178—22.08 **4 Claims**



1. For microcomputer systems which include a program memory and a microprocessor having executing means for executing sets of microinstructions, said executing means including a microinstruction memory for storing sets of microinstructions and an instruction decoder means for converting a control word to a microinstruction memory address, each set of microinstructions being assigned a publicly known OP code, and each set being activated in response to a related control word, the method of securing from unauthorized copying of a program stored in the program memory as a sequence of instructions wherein each instruction includes a control word, said method comprising the steps of

defining a set of proprietary control words wherein each control is assigned a distinct publicly known OP code and its set of microinstructions,

initially partially fabricating the microprocessors including their microinstruction memories such that each microin-

struction set starts at a known address, said partially initially fabricating step, including an incomplete fabrication of the instruction decoder means,

finishing the fabricating by completely fabricating the instruction decoder means such that each proprietary control word received by an instruction decoder means is converted to the address of the microinstruction memory which stores the first microinstruction of the set of microinstructions assigned to such received proprietary control word, and

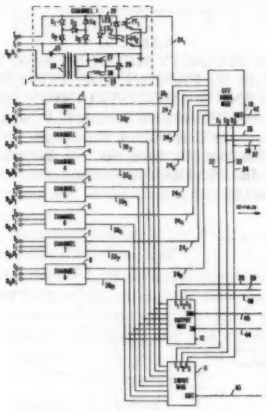
recording the program to be protected in the program memories wherein each instruction includes the proprietary control word assigned to a desired set of microinstructions.

4,513,175

AUTOMATIC CALLING SYSTEMS FOR ACCESSING COMMUNICATIONS NETWORKS

Fred J. Smith, Plantation, Fla., assignor to Jayem Dialer Corp., Westfield, N.J.

Filed Apr. 21, 1982, Ser. No. 370,605
Int. Cl.³ H04M *1/274, 3/44, 15/10*
U.S. Cl. 179—18 BA **29 Claims**



1. Automatic calling apparatus comprising:

a plurality of channel connector means for interconnecting a plurality of telephone sets to a plurality of telephone lines, each of said plurality of channel connector means connecting at least an associated one of said plurality of telephone lines to at least one of said plurality of telephone sets, each of said plurality of channel connector means including means for sensing an off hook condition of a telephone set connected thereto and signal means for conveying signal information between said telephone line and a telephone set connected thereto and for coupling and decoupling signal information to and from a connected telephone line and telephone set;

means for receiving signal information from said signal means present in any selected one of said plurality of channel connector means;

means for applying signal information to said signal means present in any selected one of said plurality of channel connector means;

means for receiving off hook condition information from said means for sensing in any selected one of said plurality of channel connector means; and

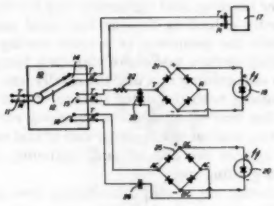
means for simultaneously monitoring for off hook condition information from said means for sensing and for signal information from said means for receiving signal information in any selected one of said plurality of channel connector means.

4,513,176

TEST APPARATUS FOR TELEPHONE EQUIPMENT

Edgar H. Fostveit, 728 Railroad St., DeRuyter, N.Y. 13052

Filed Feb. 28, 1983, Ser. No. 470,490
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—175.1 R **11 Claims**



1. A self-contained, independent trouble source locater for use by a telephone customer who owns the telephone instruments and wiring in his home, the trouble source locater being operated by the customer alone without the need for any outside assistance, said wiring originating at a telephone company wiring junction at the customer's house, the wiring junction being connected to an external telephone company line; the trouble source locater comprising a single, multiple position switch connected on one side to the telephone company wiring junction at the customer's house, the switch having a first switch position connected through the customer owned wiring to his telephone instruments, the multiple position switch normally being maintained in its first switch position whereby the telephone instruments are operably connected to the telephone company wiring junction, the multiple position switch having another switch position, and a self-contained ringing test circuit operably connected to said other switch position, the ringing test circuit including means to indicate whether or not the telephone company's bell ringing voltage is being received at the wiring junction, movement of the switch out of its first position and into its other position being operable to disconnect the customer's wiring and telephone instruments from the telephone company wiring junction and to connect the latter to the ringing test circuit, the indicator means in the test circuit being actuated if the telephone company's bell ringing voltage is being received at the wiring junction and failing to be actuated if such voltage is not being received.

4,513,177

LOUDSPEAKING TELEPHONE SYSTEM

Masakazu Nishino, Yokohama, and Hisashi Fujisaki, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

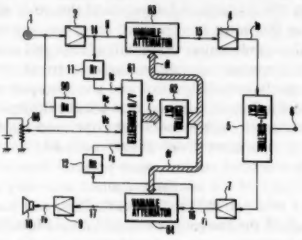
Filed Dec. 7, 1981, Ser. No. 328,088
Claims priority, application Japan, Dec. 9, 1980, 55-173470
Int. Cl.³ H04M *1/60*
U.S. Cl. 179—81 B **5 Claims**

1. In a loudspeaking telephone system of the type in which voice signals on transmission and reception speech channels are respectively detected to produce control signals, and these control signals are compared to judge the levels of the voice signals on both the speech channels so that the switching between both the channels is effected under the control of loss of digitally controlled attenuators inserted in both the speech channels, the improvement wherein said system comprises:

means for converting the control signals corresponding to the voice signals on both the transmission and reception

speech channels through analog-to-digital conversion into digital signals; and

means, with the use of a microprocessor as a calculating unit, for comparing the magnitudes of transmission and recep-



tion signals by arithmetic operation on the digital signals attained through said conversion, and effecting a control of the switching of the loss of said digitally controlled attenuators based on the result of said comparison.

4,513,178

SIGNAL PROCESSING ARRANGEMENT

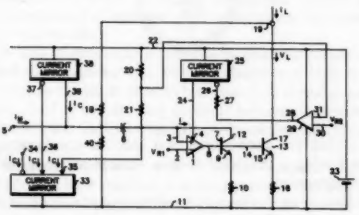
Sam A. Hing, Gland, Switzerland, and Michel Guillien, Gex, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1983, Ser. No. 485,819

Claims priority, application France, Apr. 21, 1982, 82 06865

Int. Cl.³ H04M *19/00*

U.S. Cl. 179—81 R **22 Claims**



1. A signal processing arrangement comprising:

an operational amplifier having a first input terminal for receiving a reference potential, a second input terminal, and an output terminal;

negative feedback means coupled between the output terminal of the amplifier and the second input terminal;

a further input terminal for receiving signals to be processed;

capacitive means coupled between the further input terminal and the second input terminal of the amplifier; and

means for coupling a predetermined control current to the second input terminal of the amplifier and as an equal and opposite current to the further input terminal;

whereby an output current of the signal processing arrangement derived from the output terminal of the operational amplifier is regulated in accordance with the predetermined control current, and the effects of unwanted A.C. components in the predetermined control current reduced.

4,513,179

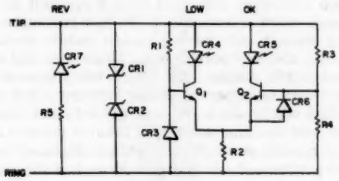
LOOP TEST CIRCUIT

Lot Phillips, Brookline; Hollis B. Austin, Manchester, and Kenneth S. Blakeslee, Sutton, all of N.H., assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 21, 1983, Ser. No. 487,057

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 R **12 Claims**



1. An electrical test circuit for use in testing tip and ring conditions of a telephone subscriber's loop, the circuit comprising: a pair of terminals connectable to tip and ring, respectively, and three separate light emitters connected across the terminals and selectively energizable by loop current, first means for engerizing the first light emitter only in response to a reverse polarity condition of tip and ring, transistor means for energizing the second light emitter only in response to an abnormally low current, forward polarity condition of tip and ring, and transistor means for energizing the third light emitter only in response to a correct loop current, forward polarity condition of tip and ring.

4,513,180

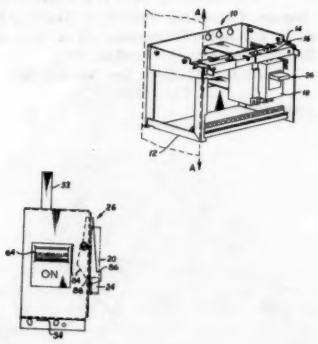
CIRCUIT BREAKER OPERATOR AND INTERLOCK

Samir F. Farag; Edgar W. Allen, and Thomas R. Little, all of Wichita Falls, Tex., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Jan. 24, 1984, Ser. No. 573,384

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—50 R **20 Claims**



1. A circuit breaker operator, comprising:

a frame having a middle portion having an opening, a top portion having an opening and angularly extending from said middle portion in a preselected direction, a bottom portion angularly extending from said middle portion in a preselected direction, a mounting portion having an opening and being connected to said bottom portion, and a right edge portion;

an operator driver having an opening and a protrusion and being movable between a first position at which said

opening is displaced toward said bottom portion of said frame and said protrusion extends through said opening in said top portion of said frame a first preselected distance above said top portion and a second position at which said opening is displaced from said bottom portion and said protrusion extends a second preselected distance above said top portion, said second preselected distance being greater than said first preselected distance;

an operator assembly having a base portion having a latch stop and being connected to said operator driver and a handle portion connected to the base portion and protruding through said opening of said middle portion of said frame, said base portion being larger than said opening of said middle portion, said handle being moveable in concert with said operator driver between a first position at which said handle is displaced toward said bottom portion and said operator driver is at the first position and a second position at which said handle is displaced toward said top portion and said operator driver is at the second position;

first means for urging said operator driver and said handle toward the second position;

a latch assembly having latch member having a left edge portion, a protrusion, and an indentation engageable with said latch stop of said base portion of said operator assembly and second means for urging said latch indentation into engagement with said latch stop, said handle and operator driver being fixed at the first position in response to said indentation being engaged with said latch stop, said protrusion being movable between a first position at which said protrusion is generally aligned with said right edge portion of said frame and said indentation is engaged with said latch stop and a second position at which said protrusion extends beyond said right edge portion and said indentation is free of engagement with said latch stop, said latch stop automatically moving into abutting contact with said left edge portion in response to movement of said protrusion from the first position to the second position thereby freeing said operator driver and handle for movement from the first position to the second position.

4,513,181

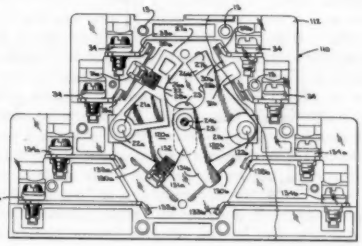
COMBINATION MECHANICAL AND ELECTRICAL INTERLOCK MECHANISM

Gerd C. Boysen, Greenfield; Patrick S. Murray, Racine, and Marquis B. Robinson, Wauwatosa, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 23, 1984, Ser. No. 581,742

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—50 C **9 Claims**



1. In an interlock mechanism for a pair of circuit controllers each having normally open contact assemblies concurrently operable with a respective circuit controller, said mechanism responsive to movement of individual controller elements movable in the same direction, said mechanism comprising a stationary support member, first and second movable operators supported by said support members, each of said operators including means for respectively engaging one of said individual controller elements, each of said operators including a blocking formation, said operators being independently movable from a first position to a second position, said operators positioned so that predetermined movement of either operator partway from its first position toward its second position places the blocking formation of this operator in the path of movement of the blocking formation of the other of said operators so that the latter is prevented from moving to its second position; the combination therewith of first and second electrical interlock contact assemblies, each electrical contact assembly respectively including a first and a second pair of stationary contacts and a first and second movable bridging contact, said bridging contacts each respectively operated by the said first and second operators from a first normally closed contact position to a second contact open position concurrently with contact closure of the auxiliary contact assembly of a respective one of said pair of circuit controllers, and biasing means urging each of the movable contacts of said interlock contact assemblies towards contact closed position.

4,513,182

LIGHTBULB SOCKET

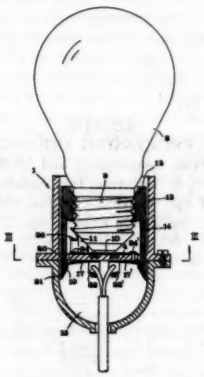
Lars Juntti, Poppovägen 19, 82500 Iggesund, Sweden

Filed Oct. 12, 1982, Ser. No. 433,703

Claims priority, application Sweden, Oct. 13, 1981, 8106047

Int. Cl.³ H01R *33/18*

U.S. Cl. 200—51.09 **6 Claims**



1. A socket for connecting two electric conductors to a lightbulb having a threaded base with side and central electrodes, comprising:

a shell having an electrically insulating partition dividing the shell into a first region and an outwardly open second region, said partition having at least two apertures therein;

an element having an internally threaded receiving ring disposed in the second region of the shell to receive the base of the bulb, said element having at least two electrically insulating legs which extend through said at least two apertures in said partition and which have ends disposed in the first region of the shell, said element being movable between a first position in relation to the shell when the bulb is unscrewed from the receiving ring and a second position in relation to the shell when the bulb is screwed into the receiving ring;

first and second contact members mounted in the second portion of the shell for electric contact with the central and side electrodes of the bulb, respectively;

a pair of connector elements in electrical contact with said first and second contact members respectively, said connector elements passing through said partition; and

spring means for biassing said element toward said first position and for additionally electrically coupling said

contact members to respective ones of said electric conductors when said element is in said second position and breaking the electrical coupling when the element is in said first position, said spring means including a pair of bent or curved spring leaves disposed within the first region of the shell, each spring leaf being at one point attached to the partition, being mechanically connected, at a point spaced apart from said point of attachment, to a respective leg of said element adjacent an end thereof, being located adjacent a respective connector element so as to contact the respective connector element when the spring leaf is straightened by screwing the bulb into the receiving ring, and being electrically connected to a respective one of the electric conductors.

4,513,183

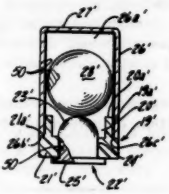
GRAVITY SWITCH

Clinton W. Hill, Romeo, Mich., assignor to U.S. Plastics Corporation, Mt. Clemens, Mich.

Continuation-in-part of Ser. No. 491,492, May 4, 1983, Pat. No. 4,467,154. This application Apr. 30, 1984, Ser. No. 605,036

Int. Cl.³ H01H *35/02*

U.S. Cl. 200—61.45 R **15 Claims**



1. A gravity switch comprising:

(A) a cylindrical shell member of conductive material closed at one end and open at the other end;

(B) a base member of dielectric material closing the open end of said shell member;

(C) an electrical contact extending axially through said base member to present a contact tip surface located adjacent the open end of the said shell member on the central axis of that member;

(D) a ball of conductive material positioned rollably within said shell member and having a diameter which is slightly less than the inner diameter of said shell member and more than half of the shortest distance between said contact tip surface and the inner surface of the closed end of said shell member;

(E) said shell member and electrical contact cooperating with said base member for hermetrically sealing the interior of said shell member within which said ball is rollable;

(F) said ball having a surface coating of conductive material different from the interior material of said ball; and

(G) said contact tip surface and the interior surface of said shell contactable by said ball comprising material having electrical properties comparable to the electrical properties of the material coating said ball.

4,513,184

FLOW ACTUATED SWITCH

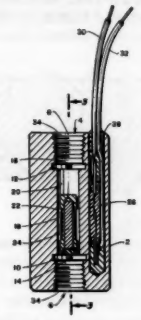
Richard E. Hughes, 821 Loma Dr., Hermosa Beach, Calif. 90254

Filed Sep. 16, 1983, Ser. No. 532,693

Int. Cl.³ H01H *35/40*

U.S. Cl. 200—81.9 M **8 Claims**

1. A fluid flow indicator comprising the combination of: a constant area body member defining a monitoring flow passageway having an inlet and an outlet, annular retaining channels at each of said inlet and outlet, first and second rod members removably positioned within said monitoring flow passageway in each of said annular retaining channels at each of said inlet and outlet, each of said first and second rod members being of inert, synthetic material and being sufficiently flexible to allow bending thereof for insertion of its termini into each of opposed portions of said annular retaining channels; and a magnetic plunger member captively disposed within said monitoring flow passageway intermediate said first and second rod members and being responsive to fluid flow by movement thereof and operatively associated switch means responsive to the position of said magnetic plunger member to energize or de-energize an electric circuit.



4,513,185

FLOAT OPERATED ELECTRICAL SWITCH ASSEMBLY

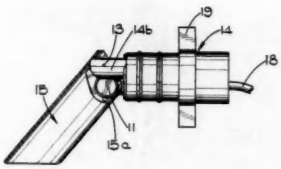
John Walters, Walsall, England, assignor to Lucas Industries, Birmingham, England

Filed Jan. 12, 1983, Ser. No. 457,373

Claims priority, application United Kingdom, Jan. 19, 1982, 8201425

Int. Cl.³ H10H *35/18*

U.S. Cl. 200—84 C **4 Claims**



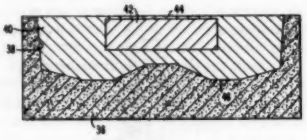
1. A float operated electrical switch assembly including a body having a longitudinal axis, a float coupled to the body for pivotal movement relative thereto about a first axis being perpendicular to the longitudinal axis of the body, a permanent magnet carried by the float and having a dipole axis parallel to said first axis, a reed switch within the body, the reed switch being position with its longitudinal axis parallel to the longitudinal axis of the body and at right-angles to said first axis, and, said first axis being spaced transversely from the longitudinal axis of said reed switch, and said magnet being so positioned relative to said first axis such that the intended operating arc of pivotal movement of the magnet relative to the reed switch is in effect movement of the magnet along the length of the of the reed switch, the magnet being adjacent one end of the reed switch at one end of said arc, and being adjacent the contact region of the reed switch at the other end of said arc.

4,513,186

VACUUM INTERRUPTER CONTACT STRUCTURE AND METHOD OF FABRICATION

Robert L. Thomas, Big Flats, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1982, Ser. No. 452,263
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**



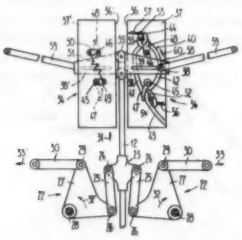
1. An electrical contact member for use in a vacuum interrupter, which contact member is electrically connectable by brazing to a conductive support stem, which contact member comprises a generally disk-like member of high temperature resistant chromium matrix material infiltrated with high conductivity copper, and comprises a predetermined density arc contact portion with a relatively high weight percentage of high conductivity copper and a higher density central back contact portion adapted to be brazed to the conductive contact support stem, which higher density central back contact portion contains about half the weight percentage of high conductivity copper as does the arc contact portion.

4,513,187

HIGH-VOLTAGE CIRCUIT BREAKER INCLUDING CUT-ON RESISTOR

Walter Schaad, Oberentfelden, and Peter Kull, Schafisheim, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Dec. 12, 1983, Ser. No. 560,575
Claims priority, application Switzerland, Dec. 17, 1982, 7367/82
Int. Cl.³ H01N *33/16*
U.S. Cl. 200—144 AP **12 Claims**



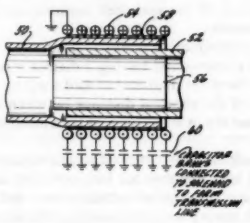
1. A high-voltage circuit breaker comprising:
at least one primary switching position;
at least one auxiliary switching position connected in parallel to said at least one primary switching position;
at least one cut-on resistor series connected to said at least one auxiliary switching position;
a common drive rod operatively associated with both said at least one primary switching position and said at least one auxiliary switching position and reciprocatingly movable in substantially longitudinal direction in a predetermined direction of movement;
a first transmission system coupled to said drive rod and operatively associated with said at least one primary switching position;
a second transmission system coupled to said drive rod and comprising an actuator rod and a cam;
a follower member cooperating with said cam;
said actuator rod being controlled at one end thereof by said follower member cooperating with said cam and being operatively associated with said at least one auxiliary switching position;
said actuator rod being movable in a predetermined plane of movement;
means for providing during a cut-on stroke a chronological operational sequence in which first said at least one auxiliary switching position is closed, then said at least one primary switching position is closed, and thereafter said at least one auxiliary switching position is opened;
said means comprising:
a stationarily arranged cam track defined by said cam and containing a closed loop extending in a plane and having a width;
said closed loop being substantially arranged in said plane of movement of said actuator rod;
said cam track being engaged by said follower member;
a bracket mounted to said drive rod and extending substantially parallel to said plane in which said cam track is arranged;
said bracket possessing an elongated hole traversed by said follower member and extending transversely relative to said predetermined direction of movement of said drive rod at least across said width of said closed loop; and
means for guiding said follower member in only one revolving direction of movement through said closed loop.

4,513,188

SYSTEM AND METHOD FOR IMPACT WELDING BY MAGNETIC IMPLOSION

Jack Katzenstein, 855 Haverford Rd., Ramona, Calif. 92065

Filed Oct. 20, 1981, Ser. No. 312,964
Int. Cl.³ H05B *5/00, 6/00*
U.S. Cl. 219—9.5 **13 Claims**



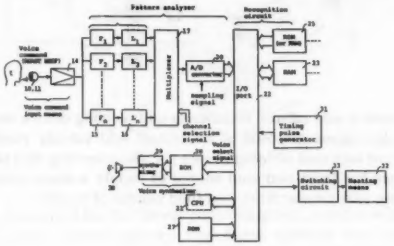
6. A system for impact welding by magnetic implosion applicable to pipe welding comprising:
a ballistic work piece in the form of a ring disposed about a work piece to be welded;
driving coil means in the form of a ring disposed upon said ballistic work piece, said driving coil means being connectable to a power source and being configured to maximize efficiency of conversion of electrical energy of said power source of kinetic energy of said ballistic work piece, by appropriate selection of a coupling paremeter of said power source and said driving coil means with said ballistic work piece; and
an insulator mounted between said ballistic work piece member and said driving coil means to prevent passage of electrical current between said coil means and said ballistic work piece.

4,513,189

HEATING APPARATUS HAVING VOICE COMMAND CONTROL OPERATIVE IN A CONVERSATIONAL PROCESSING MANNER

Shigeki Ueda, Nara, and Teruhisa Takano, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 217,685, Dec. 18, 1980, Pat. No. 4,340,800. This application Jun. 18, 1982, Ser. No. 390,138
Claims priority, application Japan, Dec. 21, 1979, 54-167407
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.³ H05B *6/06*
U.S. Cl. 219—10.55 B **4 Claims**



1. In a voice command controlled heating apparatus, for carrying out one of a plurality of preprogrammed cooking sequences, the improvement comprising:

an interactive voice command control system including means for operating in various modes, one at a time as follows:

(1) a first voice recognition mode for receiving a first voice command from a user;

(2) a voice syntheiszing mode wherein the appartus synthesizes voice data asking the user to make some choice that is related to his first voice command;

(3) a second voice recognition mode for receiving a user's second voice command indicating his choice, said second voice recognition mode recognizing a smaller number of kinds of voice commands which are determined responding to the first voice command, than that can be recognized by the first voice recognition mode, and

(4) an enforcing mode for carrying out a selected pre-programmed cooking sequence corresponding to the first and second voice commands, the control system generally progressing in operation from the first voice recognition mode to the enforcing mode with mode changes from the second voice recognition mode to either the first voice recognition mode or voice synthesizing mode permitted for clarifications of voice commands not recognized by said interactive voice command control system.

4,513,190

PROTECTION OF SEMICONDUCTOR WIRE BONDING CAPILLARY FROM SPARK EROSION

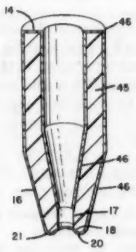
Kenneth W. Ellett, San Rafael, Calif., and Peter Glutz, Lyss, Switzerland, assignors to Small Precision Tools, Inc., San Rafael, Calif.

Filed Jan. 3, 1983, Ser. No. 455,038
Int. Cl.³ B23K *11/32*
U.S. Cl. 219—56.21 **19 Claims**

1. A wire bonding capillary apparatus which includes in combination:

(a) a capillary member formed of hard, electrically non-conductive material, said capillary including an internal bore extending axially of said capillary, said bore having a first cylindrical shape for a first portion thereof, a frustoconical shape for an adjacent portion thereof and a second cylindrical shape for a portion adjacent said frustoconical portion remote from said first cylindrical shape, the outer surface of said member having a cylindrical shape for a first portion thereof and a frustoconical shape for an adjacent portion thereof, and a rounded portion connecting said frustoconical shape on said outer surface, and

(b) a continuous electrically conductive layer disposed on and adhered to the external surfaces of said bore and said outer surface of said capillary member, said conductive



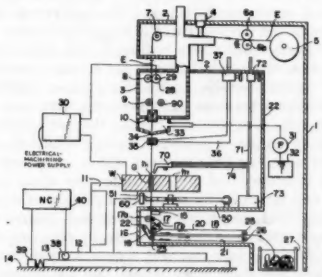
layer extending in said bore from substantially the outside edge of said second cylindrical shape portion to substantially the outside edge of said first cylindrical shape portion and extending on said outer portion from substantially the outside edge of said frustoconical shape portion to substantially the outside portion of said cylindrical shape portion.

4,513,191

METHOD OF AND APPARATUS FOR RESETTING A WIRE ELECTRODE IN AN OPERATING SETUP ON AN ELECTROEROSION MACHINE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed May 6, 1981, Ser. No. 261,269
Claims priority, application Japan, May 13, 1980, 55-62297; May 14, 1980, 55-62735
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 M **6 Claims**



1. A method of automatically resetting a wire electrode in an operating setup on a traveling-wire electroerosion machine, which method comprises the steps of:

(a) terminating a previous machining operation commenced with a given starting hole in a workpiece and performed with said machine, by shutting off the supply of a machining electrical current to said wire electrode, halting a machining axial advance of said wire electrode extending in a continuous stretch between a supply side and a collection side along a straight path traversing said workpiece, and discontinuing the supply of a machining liquid to said wire electrode;

(b) blowing off with a high-pressure stream of gas, any residue of said machining liquid which remains adherent to said halted wire electrode at least in a region adjacent to said workpiece and located at one of the opposite sides thereof;

(c) subsequent to step (b), heating said wire electrode at least along said region to remove internal stress of said wire electrode in said region;

(d) breaking, by severing, the wire electrode in said heated region; and

(e) threading one broken end portion of the broken wire electrode through a new starting hole in a workpiece for machining a contour therein in the subsequent machining operation to reestablish a said continuous stretch of said wire electrode between said supply and collection sides.

4,513,192

TW-EDM METHOD AND APPARATUS WITH EXCESS FLUID STRIPPING GAS JET NOZZLE

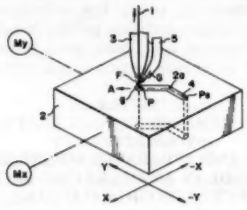
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 13, 1983, Ser. No. 503,846

Claims priority, application Japan, Jun. 11, 1982, 57-101077

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **4 Claims**



1. In a method of electrical-discharge-cutting an electrically conductive workpiece wherein a continuous electrode wire is axially transported from a supply side to a takeup side continuously to travel through the workpiece while a relative displacement is effected between the traveling wire and the workpiece such that the wire is advanced in the workpiece along a prescribed cutting path in a direction transverse to the axial transport of the wire and to the length dimension thereof as material is electroerosively removed from the workpiece by the a action of electrical discharges across a machining gap flooded within a weakly conductive aqueous machining fluid and maintained between the advancing wire and the workpiece, thereby progressively cutting the workpiece along the said path developing a groove of cutting behind the advancing electrode wire, the improvement which comprises increasing the rate of advance of the electrode wire along said cutting path in said direction by stripping a portion of said flooding machining fluid which is existent in said groove of cutting behind said advancing electrode wire, by directing a stream of a pressurized gas into the said region so that the discharge velocity of said fluid from behind said advancing electrode wire is greater than the passage of said fluid from the gap ahead of said advancing wire in said direction.

4,513,193

AUTOMATIC STUD WELDING EQUIPMENT WITH FLUID AND STUD FEEDING

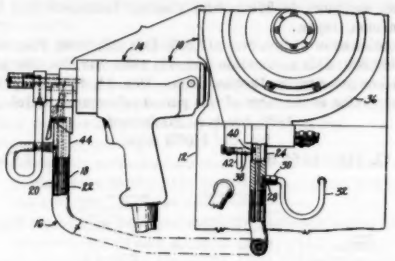
Donald H. Ettinger, Royal Oak, Mich., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 10, 1982, Ser. No. 447,269

Int. Cl.³ B23K *9/20*

U.S. Cl. 219—98 **5 Claims**

3. In combination with stud welding apparatus wherein fluid is fed from a remote source of supply and deposited about a weld area in a welding process and studs are automatically fed from a remote source of supply to a stud welding device, the improvement comprising a unitary tubular member for transporting both said studs and said fluid through separate passages



disposed in said tubular member to said welding device which includes means disposed at an end of said tubular member adjacent said stud welding device for disconnecting said tubular member from said stud source of supply without disconnecting said tubular from said fluid source of supply.

4,513,194

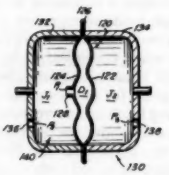
METHODS OF WELDING

Michael Mastromatteo, 61 Suffern La., Garnerville, N.Y. 10923

Continuation-in-part of Ser. No. 956,229, Oct. 30, 1978, Pat. No. 4,265,389. This application Mar. 16, 1981, Ser. No. 244,153

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EC **28 Claims**



1. The method of welding, comprising:

(a) providing at least two housing sections with inner and outer peripheral edges and planar parallel surfaces therebetween;

(b) providing a diaphragm with a planar peripheral portion for being held by at least a part of the parallel surfaces of the housing sections;

(c) sandwiching the diaphragm between at least the two housing sections;

(d) selectively melting the housing sections along the outer peripheral edges of the sandwich, thereby expanding the liquid metal; the step of melting includes electron beam welding

(e) forcing the liquified metal of the housing sections out of the sandwich at the edges by the clamping of the housing sections to provide a component of force perpendicular to the sandwich edges

(f) cooling the melted portion of the sandwich to thereby cause the housing sections to solidify and draw together, forming an impenetrable seal and pressure-resistant weld.

4,513,195

METHOD AND APPARATUS FOR THE LATERAL POSITIONING OF A MEMBER RELATIVE TO A JOINT

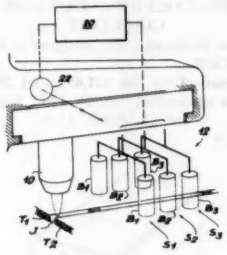
Jean-Marie Detriche, Saint Germain en Laye, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 15, 1983, Ser. No. 532,394

Claims priority, application France, Sep. 15, 1982, 82 15569

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—124.34 **12 Claims**



1. A method for the lateral positioning of a member relative to a joint formed between two metal surfaces and having discontinuities, according to which use is made of at least two eddy current probes staggered in the direction of the joint, each probe having two coils positioned on either side of said joint and arranged symmetrically relative to a plane perpendicular to said surfaces and passing through the joint, in a transverse plane with respect to said joint, each probe supplying a first signal which is treated to obtain a positioning signal varying with the displacement of the axis of the probe with respect to the axis of the joint, said positioning signal being transmitted to servocontrol means controlling the lateral displacement of said member, wherein the positioning signal corresponding to each of these probes is compared to a given threshold, said threshold being below the amplitude of said signal when the corresponding probe is in front of a discontinuity, the transmission of one of the positioning signals to the servocontrol means being interrupted, when said one signal is above said threshold.

4,513,196

ELECTRIC SELF-DEFROSTING WINDSHIELD HEATING ARRANGEMENT PROVIDING FAST OR SLOW HEAT

Lutz Bartelsen, Hamminkeln, and Hans-Cristoph Neuendorf, Wesel, both of Fed. Rep. of Germany, assignors to Flachglas Aktiengesellschaft, Gelsenkirchen, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 514,150

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226393

Int. Cl.³ H05B *1/02, 3/26;* **B60J** *1/00;* **F06B** *7/12*

U.S. Cl. 219—203 **7 Claims**

1. A heatable self-defrosting windshield comprising:

a transparent panel;

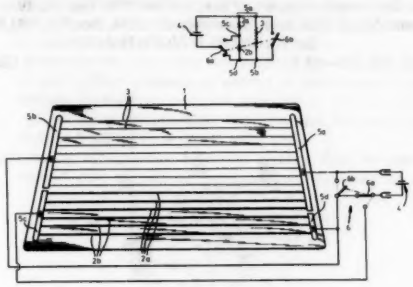
two low-resistance groups of wires embedded in the panel and defining a primary zone requiring rapid heating;

at least one high-resistance group of wires embedded in the panel and defining a secondary zone adjacent the primary zone and not requiring rapid heating; and

switch means connected to the wire groups and to an electric power source and movable between

a fast-heat position for connecting the two low-resistance groups in parallel with each other across the source and for effectively disconnecting the high-resistance wires, and

a slow-heat position for connecting the two low-resistance groups in series with each other and jointly in parallel with the high-resistance groups across the source, the



total resistance of the groups in the fast-heat position being generally the same as in the slow-heat position.

4,513,197

HEATED SEAL OF RESILIENTLY COMPRESSIBLE FOAM FOR MATCHING THE EDGE OF A HOLLOW PORTION OF AN ARTICLE TO AN IRREGULAR SURFACE

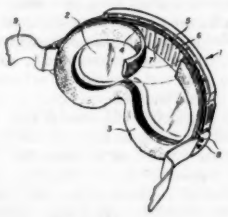
Guy Courvoisier, and Simon Arieh, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Feb. 24, 1983, Ser. No. 469,383

Claims priority, application Switzerland, Feb. 26, 1982, 1193/82

Int. Cl.³ H05B *3/06*

U.S. Cl. 219—527 **7 Claims**



1. An article adapted to be applied to a surface of the irregular contour and shape, comprising:

an object having at least an edge portion adapted to be turned toward said surface and sealingly fitted thereto;

a body of resiliently commpressible thermally softenable foam material on said object at least in the region of said edge portion;

an electric heating body embedded in said body of foam material and substantially coextensive with a face thereof adapted to confront said surface; and

electric terminals connected to said heating body for connection to a source of electric current to pass said electric current through said heating body to heat said body of foam material and thereby soften said body of foam material to cause the same to adopt the shape matching the shape and contour of said surface, thereby sealing said object to said surface at least all along said edge portion.

4,513,198

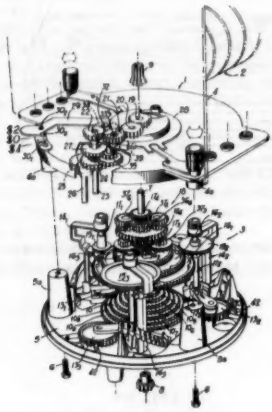
MECHANICAL COMPUTER ASSEMBLY

John C. Lockwood, Atlanta, Ga., assignor to Anniston Pump Shop, Inc., Anniston, Ala.

Continuation-in-part of Ser. No. 340,856, Jan. 20, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,950

Int. Cl.³ B67D *5/22*; F16H *3/22*

U.S. Cl. 235—61 L **5 Claims**



1. In a mechanical computer for registering the volume and price of liquid fuel and having a bottom plate and a top plate fixed in spaced relationship, a main shaft adapted to be driven by a fuel metering pump and projecting below said bottom plate, said main shaft extending through said bottom plate and top plate and projecting above said top plate, an output gear attached to said main shaft above said top plate, a stepped cone gear attached to said main shaft and disposed between said top plate and said bottom plate, a plurality of take-off gear assemblies disposed parallel to said stepped cone gear and radially disposed parallel to said stepped cone gear and radially disposed therefrom, each gear assembly consisting of a rotatable splined shaft journalled in said top plate and said bottom plate, a sliding gear mounted on said splined shaft, an idler gear engaging said sliding gear and adapted for selective engagement with any gear of said stepped cone gear, an output gear on said splined shaft engaging a differential gear mechanism disposed between said stepped cone gear and said top plate and concentric with said main shaft, each of said differential gear mechanisms in interconnected series relationship, successive take-off gear assemblies and differential gear mechanisms being in relative overall decade relationships to the preceding assembly, an output gear concentric with the main shaft and disposed above the said top plate and in engagement with the output of the last of the differential gear mechanism and further adapted to drive a price posting register, the improvement wherein the computer further comprises an auxiliary differential mechanism for establishing a further decade ratio input, said auxiliary differential mechanism being interposed between said last differential gear mechanism and said concentric gear and in operative engagement with each, a gear train consisting of two idler gears mounted on top of and external of the said top plate in engagement with said output gear on said main shaft, a pair of countershafts disposed between said top plate and said bottom plate, one of said countershafts extending through said top plate and having a gear attached thereon engaging said gear train external of said top plate, said countershafts further having interconnected gears mounted thereon disposed between said top plate and said bottom plate to establish a step up ratio, the output gear of said interconnected gears being adapted to drive the said auxiliary differential gear mechanism at an overall ratio of a decade greater than that of the previous last differential gear mechanism.

4,513,199

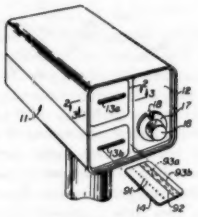
MAGNETIC CARD READ-OUT AND TIMING CIRCUITRY

George B. Sidline, Belmont, Calif., assignor to Eugene S. Elkus, Menlo Park, Calif.

Continuation-in-part of Ser. No. 201,693, Oct. 29, 1980, Pat. No. 4,361,755. This application Sep. 24, 1982, Ser. No. 422,608

Int. Cl.³ G06K *5/00*

U.S. Cl. 235—449 **10 Claims**



1. A device for use in a system to energize apparatus external to said system comprising a carrier with at least one strip of magnetic material extending longitudinally along said carrier, a first track and a second track on said magnetic material, said tracks being adjacent but parallel to and spaced from each other, said first track being magnetically encoded with first signals representing data, said first signals consisting of pulses of "1" or "0", said second track being encoded with second signals consisting of pulses having a rate which is greater than the data rate of said first signals, the assertive edge of said second track signals coinciding with the start of said pulses of said first signals, whereby said second signals may be electronically used to strobe said first signals to determine whether each said pulse of said first signal is a "1" or "0".

4,513,200

FIBER OPTIC MOVEMENT MEASURING SENSOR

Dean C. Marvin, Irvine, and Neil A. Ives, Yucaipa, both of Calif., assignors to Occidental Research Corporation, Los Angeles, Calif.

Filed Jan. 24, 1983, Ser. No. 460,421

Int. Cl.³ G02B *5/14*

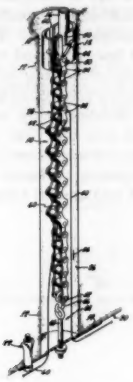
U.S. Cl. 250—227 **20 Claims**

1. A sensor for use in measuring movement between two points comprising:

a plurality of members having bearing surfaces thereon, two of said members having means attached thereto for connecting said two members to external points between which movement is desired to be measured, other members of said plurality of members being separated from, and not directly connected to, said external points;

an optic fiber disposed between at least two of said plurality of members and contacting the bearing surfaces thereon; and

means, connecting said plurality of members, for moving said other members contacting the optic fiber and causing



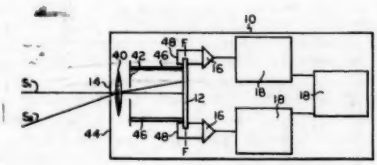
the optic fiber to bend as a function of movement between the two external points.

4,513,201

THERMOCOUPLE DETECTOR

R. Aaron Falk, Louisville, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jul. 21, 1983, Ser. No. 515,822
Int. Cl.³ G01B *11/26;* **H01L** *35/02*
U.S. Cl. 250—342 **12 Claims**



1. An apparatus for determining the directional orientation of a source of radiation comprising:

a detector having a substrate and two rectangular arrays of thermocouple strips fixed to opposite surfaces of the substrate,

aperture means for restricting the radiation incident on the detector from a distant source to a preselected small area for one of the rectangular arrays,

sensing means for sensing voltage differentials between the two rectangular arrays, and

means for calculating the orientation of the source based on the sensed differential.

4,513,202

SELF COMPENSATING FIRE DETECTION DEVICE

John M. Cholin, Hackensack, N.J., assignor to Firetek Corporation, Hawthorne, N.J.

Filed May 14, 1982, Ser. No. 378,090
Int. Cl.³ G08B *17/10;* **H01J** *47/02*
U.S. Cl. 250—385 **8 Claims**

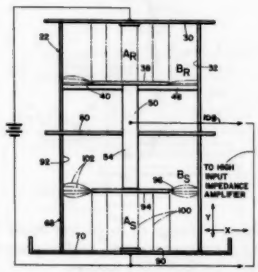
1. A self compensating device employing ionization principles, for responding to alterations in the condition of the gas medium in the environment in which the device is placed comprising:

(a) an ionization chamber including a first member having first and second conductive surface portions, and a second member having third and fourth conductive surface portions;

(b) means for ionizing the gas within the chamber, said means placed physically in relation to the first, second, third, and fourth surface portions so as to create a substantially linear, ionization condition in the volume between respective pairs of said surface portions;

(c) means for creating a first electric field between a first pair of said surface portions consisting of said first and third surface conductive portions whereby a first ionization current flows substantially between said first and third surface conductive portions only; and

(d) means for creating a second electric field between a second pair of said surface portions consisting of said



second and fourth surface conductive portions whereby a second ionization current flows substantially between said second and fourth surface conductive portions only;

the area dimensions of the first and third surface portions and the second and fourth surface portions, the respective intervening volumes and distances there between, and the relative orientation of the surface pairs calculated and placed such that said first ionization current substantially equals in magnitude said second ionization current, and such that said first ionization current is axially orthogonal to said second ionization current;

said ionization chamber including openings whereby the surrounding gas medium can enter the chamber and pass through said intervening volumes.

4,513,203

MASK AND SYSTEM FOR MUTUALLY ALIGNING OBJECTS IN RAY EXPOSURE SYSTEMS

Harald Bohlen, Böblingen; Helmut Engelke, Altdorf; Johann Greschner, Pliezhausen; Reinhold Mühl, Altdorf; Peter Nehmiz, and Hans J. Trumpp, both of Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 381,666, May 24, 1982, abandoned.
This application Jun. 29, 1984, Ser. No. 625,586
Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121666
Int. Cl.³ G01N *21/00, 23/00*
U.S. Cl. 250—491.1 **23 Claims**

1. In a system for exposing a substrate with respect to an alignment structure comprising

said alignment structure including means for detecting alignment radiation,

an exposure mask having a mask pattern thereon and a registration pattern thereon,

said exposure mask being in adjacent relation and close proximity to said substrate,

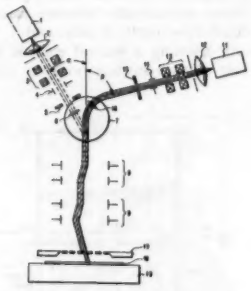
an electron beam means for generating electron beam alignment radiation adapted for use in detecting registration of said mask and said substrate,

said electron beam means generating said electron beam for

directing said alignment beam to pass through said registration pattern to said alignment structure whereby said means for detecting is energized by said alignment beam,

said exposure mask with said registration pattern being adapted to be registered with said alignment structure on said substrate by passage of said electron beam through said registration pattern,

an additional source of exposure rays other than an electron



beam such as a source of x- or ion beam rays directed towards said exposure mask, said exposure rays being directed through said mask pattern,

means for applying a magnetic field to bend said electron beam,

said magnetic field extending perpendicularly to said electron beam whereby said electron beam is bent to extend collaterally to said exposure rays which extend towards said substrate.

4,513,204

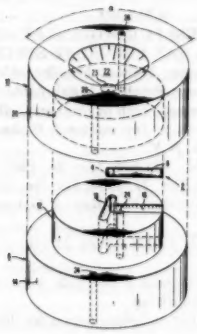
HOUSING FOR A RADIOACTIVE SOURCE

James R. Domnanovich, Roselle, and William D. Erwin, Prospect Heights, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Aug. 27, 1982, Ser. No. 412,224

Int. Cl.³ G21F 5/02

U.S. Cl. 250—496.1 **11 Claims**



1. A housing for a radioactive source which is to be attached to a patient, comprising in combination:

(a) a first shielding body having a protrusion, said protrusion containing a first recess for inserting said radioactive source therein,

(b) a second shielding body having

(b1) a second recess in the surface thereof, said second recess having a shape such that said protrusion fits therein, and

(b2) a conical aperture communicating with said second recess, said radioactive source emitting radiation through said conical aperture when said source is inserted into said first recess and when said protrusion is located in said second recess; and

(c) connecting means for connecting said first shielding body to said second shielding body when said radioactive source is inserted into said first recess and when said protrusion is located in said second recess, said radioactive source thereby emitting radiation into the environment primarily through said conical aperture.

4,513,205

INNER AND OUTER WASTE STORAGE VAULTS WITH LEAK-TESTING ACCESSIBILITY

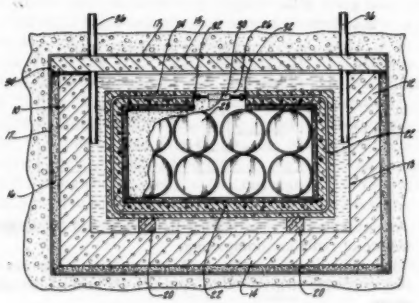
Bob C. Splinter, Badhoevedorp, Netherlands, assignor to Peckson USA Corp., New Haven, Mich.

Filed Feb. 9, 1983, Ser. No. 465,192

Claims priority, application PCT Int'l Appl., Jul. 28, 1982, PCT/NL82/00026

Int. Cl.³ G21F 5/00

U.S. Cl. 250—507.1 **10 Claims**



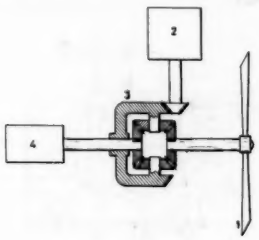
1. The method of storing waste material of the type that may pollute the environment which comprises sealing the waste materials in a container, placing the waste-filled container in a larger one-piece concrete permanent storage vault, said vault having an access opening therein to receive said container, filling the space between the walls of the container and the vault with bitumen through said access opening to completely seal the container within the vault, placing the permanent storage vault in a larger second concrete vault, the outer surfaces of which are coated with a liquid-proof material, the second vault having an open upper end closed by a cover sealed thereon, the first vault being placed in the second vault so that the top, bottom and side walls of the two vaults are spaced apart, filling said space between the two vaults with a liquid adapted to be contaminated by any waste material or radiation leaking through the walls of the permanent storage vault, sealing the second vault and providing an opening therein to said space to permit testing the liquid for contamination, and by means of said opening periodically testing the liquid for contamination.

4,513,206

EXPLOITATION OF WIND ENERGY FOR PRODUCING ELECTRICAL POWER

Vincenzo Gervasio, San Donato Milanese, and Dino Dinelli, Albano Laziale, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Sep. 1, 1981, Ser. No. 298,283
Claims priority, application Italy, Sep. 15, 1980, 24660 A/80
Int. Cl.[3] H02P 9/04; F03D 9/00
U.S. Cl. 290—4 C 2 Claims



1. An apparatus for producing electrical power by the use of wind energy, comprising a synchronous generator having an input shaft and a bevel pinion connected thereto; a wind rotor having a shaft connected thereto which is adapted to be rotated by said rotor in response to the speed of the wind; a prime mover having a shaft connected thereto which is adapted to be rotated at an angular speed, means operatively connected to said prime mover and said wind rotor for varying the angular speed of said prime mover shaft in response to the angular speed of said wind rotor shaft so that a constant angular speed drive is adapted to be transferred to said generator which equals the sum of the angular speeds of said prime mover and wind rotor shafts; a differential which sums the angular speeds of said shafts for transfer to said generator, including a carrier, a pair of planet pinions freely mounted on said carrier, a pair of sun pinions wherein one sun pinion is fixedly mounted on said prime mover shaft and wherein the other sun pinion is fixedly mounted on said wind rotor, and a planet pinion on such carrier which meshes with said bevel pinion for transfer of the sum of the angular speeds of said prime mover and wind rotor to said generator; and

a servo device connected to the shaft of the prime mover and to a feed control of the prime mover whereby the feed can be adjusted as a function of the speed of the wind rotor so that the wind rotor works at the maximum efficiency, including a tachometer connected to the shaft of the prime mover and to an injector control device, said injector control device is connected to a fuel injector which is connected to the prime mover for adjusting the angular speed to correspond to the maximum mechanical power at the shaft of the wind rotor.

4,513,207

ALTERNATING COMPARATOR CIRCUITRY FOR IMPROVED DISCRETE SAMPLING RESISTANCE CONTROL

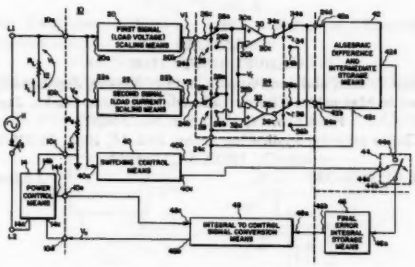
Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,306
Int. Cl.[3] H01H 47/00
U.S. Cl. 307—126 19 Claims

1. In a circuit for controlling the resistance of a load receiving energy from an electrical source, said circuit being of the type having: means connected between said source and said load for varying the current flowing through said load responsive to a control signal, means for monitoring the voltage across said load to provide a first signal; means for monitoring the current flowing through said load to provide a second signal; comparison means receiving said first and second signals and first and second reference signals for providing an output signal having a characteristic indicative of the time at which the magnitude of said first signal exceeds the magnitude of the first reference signal with respect to the time at which the magnitude of the second signal exceeds the magnitude of the second reference signal; and means for providing said control signal responsive to said comparison means output signal to cause said load resistance to be maintained at a substantially constant and predetermined value, the improvement wherein said comparison means comprises:

first and second comparators, each having a first input, a second input receiving one of said reference signals, and an output;

input switching means for connecting said first signal to said first comparator first input and said second signal to said



second comparator first input responsive to a first state of a comparison control signal and for connecting said first signal to said second comparator first input and said second signal to said first comparator first input responsive to another state of said comparison control signal;

intermediate means for temporarily storing the magnitude of a physical quantity to provide said comparison means output signal responsive to a change in said physical quantity magnitude; and

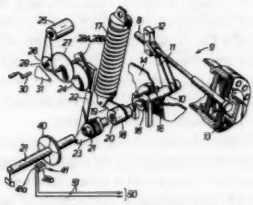
difference means for controlling the physical quantity magnitude responsive to the difference in the signals at said first and second comparator outputs during consecutive occurrences of the first and second comparison control signal states to effectively compensate the change in physical quantity magnitude for any errors introduced by at least one of the first and second comparators.

4,513,208

ELECTRICAL SWITCHGEAR

Isao Kamata, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 23, 1984, Ser. No. 582,765
Claims priority, application Japan, Feb. 28, 1983, 58-31024
Int. Cl.[3] H01H 71/04, 33/00
U.S. Cl. 307—139 5 Claims



1. An electrical switchgear which comprises:

fixed and movable contacts arranged in a tank filled with insulating gas;

a switch mechanism driving said movable contact, and including a mainshaft;

an operating unit connected to said main shaft of said switch mechanism;

a first positicn detector means for optically detecting the operating state of said movable contact;

an optical control unit being connected to said first detector by means of an optical cable, said optical control unit outputting a signal to said operating unit for controlling said switch mechanism.

4,513,209

LEVEL DETECTOR

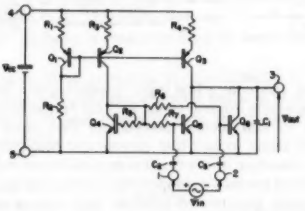
Kenzo Tanabe, and Junji Suzuki, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 11, 1982, Ser. No. 348,311

Claims priority, application Japan, Feb. 16, 1981, 56-22065

Int. Cl.³ H03K *5/153, 5/22*

U.S. Cl. 307—350 **2 Claims**



1. A level detector comprising:

first and second transistors of a first conductivity type, said first and second transistors having their bases connected together;

a third transistor of a second conductivity type opposite to that of said first conductivity type;

a resistor connected between said third transistor's base and collector;

fourth and fifth transistors of said second conductivity type, said fourth and fifth transistors having their collectors connected together;

a DC bias circuit operatively connected to said bases of said first and second transistors for supplying a DC bias thereto;

wherein said first transistor's collector is connected to said third transistor's collector, said fourth and fifth transistors' bases are respectively connected to said third transistor's collector through separate resistors, said first and second transistors' emitters are respectively connected to a first terminal of a DC power supply through separate resistors, said third and fourth and fifth transistors' emitters are connected to a second terminal of said power supply, said second transistor's collector is connected to said fourth and said fifth transistors' collectors;

wherein AC signals having the same amplitude but of opposite polarities are respectively supplied to said fourth and fifth transistors' bases and a level detected output signal is provided at said common collectors of said second and fourth and fifth transistors, and wherein said second transistor is biased in its saturation region when said AC signals are of zero amplitude levels.

4,513,210

CIRCUIT ARRANGEMENT CONSTRUCTED IN ECL CIRCUITRY

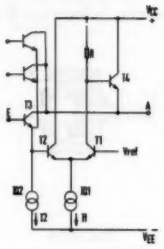
Claude Barre, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,232

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232199

Int. Cl.³ H03K *19/086, 19/20*

U.S. Cl. 307—455 **2 Claims**



1. A circuit arrangement comprising:

first and second transistors each including a base, an emitter and a collector;

said emitters connected together;

said base of said first transistor connected to a reference potential;

means connecting said collectors to a first supply potential;

a first constant current source connected to said emitters and to a second supply potential;

an input emitter follower comprising a third transistor including a base for receiving an input signal, a collector and an emitter connected to said base of said second transistor;

a second constant current source connected to said emitter of said third transistor and to a second supply potential; and

an output emitter follower comprising a fourth transistor including a base connected to said collector of said first transistor, a collector connected to the first supply potential and an emitter connected to said collector of said third transistor,

whereby said second constant current source supplies both of said input and output emitter followers.

4,513,211

DEVICE FOR DETECTING THE PRESENCE OR ABSENCE OF A CHARGE QUANTITY AND FOR STORING THE RESULT OF THIS DETECTION

Jean L. Coutures, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 24, 1982, Ser. No. 422,383

Int. Cl.³ H03K *3/356, 5/153;* **G01R** *19/165*

U.S. Cl. 307—530 **7 Claims**

1. A device for detecting the presence or absence of a charge quantity and for storing the result, comprising:

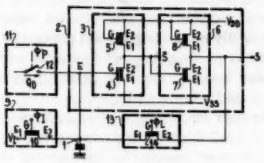
a capacitor **(1)**;

first means **(2)** having an input and an output for sensing in the form of a high or a low level, a potential V_E of the capacitor, the output of said first means constituting an output of the detection and storage device, the input and output of said first means being respectively at high and low impedance, a potential V_S of said output being able to assume two stable states and said first means having a response curve $V_S(V_E)$ with a gain greater than one in the transition zone between the two stable states;

second means **(9)** for precharging in a first time, the potential

of the capacitor at a given value, so as to have an operating point located in a first zone of the response curve $V_S(V_E)$ of the first means where $(V_S/V_E)-1$ has a first sign;

third means (11) which, in a second time, modifies or does modify the potential of the capacitor, depending on whether or not the charge quantity is present or absent, in such a way as to bring the operating point into a second zone of the response curve $V_S(V_E)$ of the first means,



where $(V_S/V_E)-1$ has a second sign, or to maintain it in the first zone, depending on whether or not the charge quantity is present or absent; and

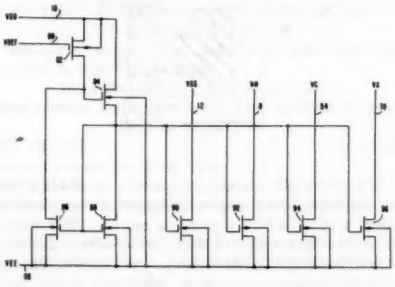
fourth means (13) which, in a third time latches the input potential V_E of the first means to equal the output potential V_S of the first means, such that the output potential V_S of the first means is at the stable state of the response curve $V_S(V_E)$ corresponding to the second or to the first zone, as a function of whether the charge quantity is present or absent.

4,513,212

AUTOMATIC P-WELL CLAMPING FOR CMOS INTEGRATED CIRCUIT

David K. Money, Pennant Hills, Australia, assignor to Electronics Pty. Ltd., Lane Cove, Australia

Filed Jul. 22, 1982, Ser. No. 401,012
Int. Cl.³ H03K *17/687, 5/01;* **A61M** *1/00*
U.S. Cl. 307—575 **24 Claims**



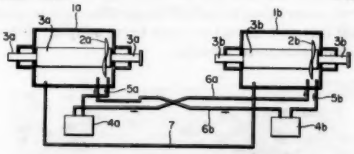
1. An integrated circuit having field-effect transistors comprising a plurality of N-channel transistors each having a P-well, source and drain terminals, and a gate terminal; a source of potential for powering all of said transistors; a plurality of nodes having potentials derived thereon, each of which may be the most negative potential in the integrated circuit at any given time; and a negative supply bus connected to all of said P-wells; characterized by a plurality of control transistors each having its drain terminal coupled to a respective one of said nodes; the source terminals of all of said control transistors being coupled to said negative supply bus; and means for applying a potential to the gate terminal of each of said control transistors to cause it to conduct a drain-to-source current; that one of the control transistors whose drain is at the most negative potential conducting a source-to-drain current to lower the potential of said negative supply bus to a value which is greater than said most negative potential by less than the forward voltage drop of a PN junction.

4,513,213

PRESSURE DENSITY EQUALIZING APPARATUS FOR TWO VESSELS

Tadao Tomiyama, Kakogawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,715
Claims priority, application Japan, Nov. 16, 1981, 56-171031
Int. Cl.³ H02K *9/26*
U.S. Cl. 310—156 **2 Claims**



1. A pressure density equalizing apparatus for a first vessel and a second vessel, both of which contain a gaseous coolant therein, said apparatus comprising:

a first gas drier and second gas drier, both operatively connected to the first and the second vessels;

a first high pressure gas pipe means for connecting the first vessel to the first gas drier;

a second high pressure gas pipe means for connecting the second vessel to the second gas drier;

a first low pressure gas pipe means for connecting the first gas drier to the second vessel;

a second low pressure gas pipe means for connecting the second gas drier to the first vessel;

a first blower mounted on a first rotary shaft in the first vessel; and

a second blower mounted on a second rotary shaft in the second vessel;

whereby, upon rotation of the first and second blowers, said gaseous coolant contained in the first and second vessels circulates from the first vessel, through the first high pressure pipe means, into the first gas drier, out of the first gas drier, through the first low pressure pipe means, into the second vessel, and from the second vessel, through the second high pressure pipe means, into the second gas drier, out of the second gas drier, through the second low pressure pipe means, into the first vessel, so that the gas pressure density in the first and the second vessels is equalized.

4,513,214

DYNAMOELECTRIC MACHINE

Bruce G. Dieringer, Toledo, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 3, 1983, Ser. No. 538,628
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—71 **7 Claims**

1. A dynamoelectric machine, comprising:

a tubular housing member having a first end and a second end;

field windings disposed within said housing member;

armature means including a shaft having a shaft extension portion and a commutator surface;

brush means adapted to be in electrical contact with said commutator surface;

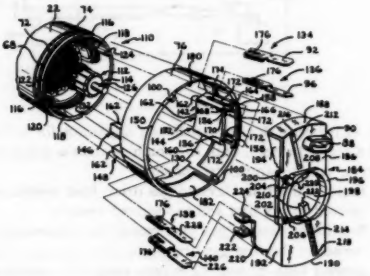
said first end of said housing member being a closed end and having said shaft extension portion passing therethrough and rotatably supported thereby;

said commutator surface being disposed adjacent said second end;

means for making electrical connection to said commutator surface and to said field windings disposed adjacent said second end;

said means for making electrical connection including a first circular member and a second elongated member;

said first circular member having a generally circular outer periphery including projection means for engaging an end surface of said tubular housing member, and an inner radial periphery including at least one inwardly projecting pocket portion for receiving supporting insulation displacing contact means for making electrical connection with said field windings and with said brush means, and further including first and second opposing arcuate recesses, said first recess being arcuately longer than said second recess, said first and second recesses being adapted to retain said second elongated member;



said first arcuate recess having a first end and said second arcuate recess having a second end, said first end and said second end being equally spaced in the same direction from a diameter of said first circular member to prevent incorrect orientation of said second elongated member;

said second elongated member including a first arcuate end portion adapted to be received in said first arcuate recess and a second arcuate end portion adapted to be received in said second arcuate recess;

said second elongated member defining an aperture therethrough, said aperture being centered between said first arcuate end portion and said second arcuate end portion for receiving said armature shaft therethrough;

said second elongated member further defining means for retaining said brush means in electrical contact with said commutator surface;

said second elongated member having a planar portion and first and second arcuate wall portions adjacent said respective first and second arcuate wall portions adjacent said respective first and second arcuate end portions, said wall portions being traverse to said planar portion and extending in a first direction therefrom;

said means for retaining said brush means each including a first radially-disposed wall portion extending from said planar portion in said first direction, a second wall portion parallel to said first wall portion and spaced therefrom and including a retaining ledge portion extending parallel to said planar portion and towards said first wall portion;

each said brush means being retained between said first and second wall portions and between said planar portion and said retaining ledge portion;

said brush means including a brush and a brush spring between each said brush and one of said first and second arcuate wall portions to urge said brush towards said commutator surface;

said second elongated member further including means for supporting a second electrical contact means connected to one said brush;

an end bell disposed adjacent said means for making electrical connection and rotatably supporting said armature shaft;

said second elongated member being disposed between said second end of said housing member and said end bell;

said second electrical contact supported by said second elongated member and said contact means supported by said inwardly projecting pocket portion of said first circular member passing through apertures in said end bell;

said tubular housing member defining an annular groove adjacent said second end;

a boot member enclosing said second end of said housing member, said boot member being provided with an inwardly directed annular flange adapted to be disposed in said annular groove to seal said boot member to said housing member;

said boot member further defining a tubular aperture for sealingly passing at least two electrical conductors each said conductors being provided with connector means adapted to be received on one of said insulation displacing contact means and said second electrical contact; and

a clamp being applied to said boot member adjacent said annular flange to retain said boot member to said housing member.

4,513,215

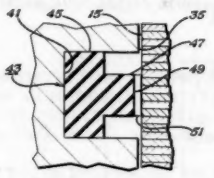
ANTI-ROTATION MOTOR BEARING

David I. Del Serra, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 3, 1983, Ser. No. 538,646

Int. Cl.[3] **H02K** *5/00*

U.S. Cl. 310—90 **5 Claims**



1. In a submersible pump motor having an oil filled housing, a stator composed of magnetic laminations mounted in the housing, a rotor which includes a plurality of spaced-apart rotor sections mounted on a shaft carried within the stator, an improved bearing assembly mounted between adjacent rotor sections for supporting the shaft, comprising in combination:

a stationary bearing having a cavity in its outer periphery; and

an element contained in the cavity, the element being of a material that swells due to influence of oil in the motor upon operation of the motor for frictionally engaging the stator to prevent rotation of the bearing.

4,513,216
MULTI-POLE ROTOR PARTICULARLY FOR SMALL AND MINIATURE ELECTRIC GENERATORS AND MOTORS

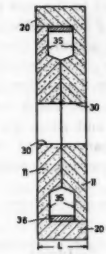
Werner Müller, Godesburg, Fed. Rep. of Germany, assignor to Magnetfabrik Bonn GmbH, vorm. Gewerkschaft Windhorst, Bonn am Rhein, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 850,049

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2727003

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—156 **2 Claims**



1. Multi-pole rotor for small and minature electric motors and generators for use in tachometers, stepping motors, synchronized clocks, and the like wherein a series of oppositely directed contiguous radially oriented magnetic poles are arranged segmentally about the periphery of the rotor extending parallel with each other and generally in the direction of the axial length of the rotor, said poles defining a continuous outer circumferential surface having alternating N-S-N-S . . . magnetic poles and a corresponding continuous inner circumferential surface having respective alternating S-N-S-N . . . magnetic poles, the respective end surfaces of all of said poles lying in only two axially spaced common planes and carrier means to mount said poles on a rotor shaft, said poles and carrier means being integrally fabricated from particulate highly coercive magnetic material with a binder, said carrier means comprising a pair of complementary disks with the integrally fabricated poles projecting generally axially from one side at the periphery of each disk, the poles of each disk being circumferentially spaced, whereby the poles of one disk will closely interfit with the poles of the other disk when the pair of disks are in axially facing abutting engagement.

4,513,217
ROTARY ARMATURE WITH COOLING OF COMMUTATOR

Syoji Kishimoto, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,434

Claims priority, application Japan, Dec. 15, 1982, 57-191734

Int. Cl.³ H02K *9/28*

U.S. Cl. 310—227 **7 Claims**

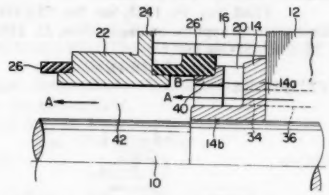
1. A rotary armature comprising:

a rotary shaft;

an armature core having an armature coil fitted onto said rotary shaft;

an armature clamp fitted onto the rotary shaft and abutting said armature core for holding said armature core in position on said rotary shaft;

a shrink ring type commutator having a plurality of commutator segments assembled into an annulus and having shrink rings at least the outsides of which are electrically insulating material on opposite ends thereof holding said segments in said annulus, the shrink ring on the end toward said armature core being rigidly connected to said armature clamp to leave a large annular ventilating space between the inner peripheral surface of said shrink ring type commutator and an outer peripheral surface of said



rotary shaft, said space being unobstructed at the end remote from said armature clamp.

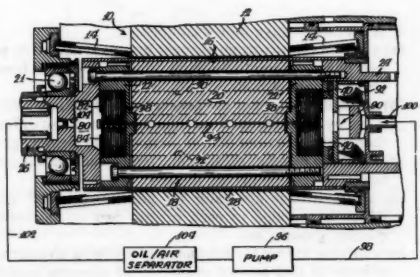
4,513,218
ROTOR COOLING IN ROTARY ELECTRIC MACHINES

Wayne W. Hansen, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 17, 1983, Ser. No. 542,492

Int. Cl.³ H02K *3/46*

U.S. Cl. 310—270 **3 Claims**



1. In a rotary electric machine the combination of:

a stator having a rotor receiving opening;

a rotor journalled within said opening, said rotor including

a body of magnetizable material having at least two opposed axially extending slots

an end turn support on each end of said body, each having a radially extending axially opening slot aligned with the slots on said body to define a continuous passage for the receipt of windings

at least one winding in said passage and composed of a plurality of turns of an electrical conductor having a generally circular cross section, said turns being precision wound in a plurality of layers such that each successive turn in a given layer is parallel to and in substantial abutment with the preceding turn and such that the turns in each successive layer are parallel to and in abutment with at least one turn in the preceding layer within said body slots,

the interstices between said turns defining axially extending coolant passages,

spacers in each of said slots in said end turn supports spacing the turns of adjacent layers a sufficient distance to allow a coolant to enter into or exit from said coolant passages, and

a pair of coolant galleries, one for each end turn support and in fluid communication with the associated slot in the corresponding end turn support; and

means interconnecting each of said galleries for circulating a liquid coolant between the same via said coolant passages and said slots in said end turn supports.

4,513,219
VIBRATION WAVE MOTOR

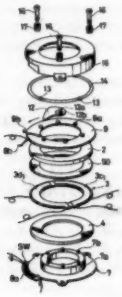
Makoto Katsuma, Kawasaki; Hiroyasu Murakami, Tokyo, and Akira Hiramatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,373

Claims priority, application Japan, Nov. 25, 1982, 57-206299; Nov. 25, 1982, 57-206300

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—328 **10 Claims**



1. A vibration wave motor comprising:

(a) a pair of electro-strain element groups arranged or polarized phase-differentially, each group including at least one electro-strain element;

(b) a vibrating member for generating a travelling vibration wave by application of voltages having a phase difference therebetween to said pair of electro-strain element groups;

(c) a moving member press-contacted to said vibrating member to be friction-driven thereby;

(d) a DC voltage generator for generating a DC voltage which is supplied to each of said pair of electro-strain element groups; and

(e) a driving circuit for substantially applying an alternating voltage to said pair of electro-strain element groups by time divisionally alternating the direction of DC voltage to be applied to said pair of electro-strain element groups.

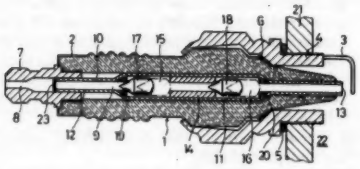
4,513,220
IGNITION PLUG WITH AIR PASSAGE AND DOUBLE CHECK VALVE

Mokichi Togashi, 16-10, Okudo 2-chome, Katsushika-ku, Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,168

Int. Cl.³ H01T *13/02*; F16K *15/00*

U.S. Cl. 313—120 **5 Claims**



1. An ignition plug having one end thereof leading to the engine cylinder and the other end thereof leading to ambient air which comprises

a housing adapted to be secured to the engine cylinder,

an insulator inserted in said housing, said insulator having a central bore,

a tubular center electrode having an air passage extending therethrough, said electrode being disposed within the central bore of the insulator, said tubular electrode having a middle portion of enlarged cross-section for housing a check valve therein, said check valve including a tubular partition disposed within said middle portion for internally dividing said middle portion into two valve spaces, said tubular partition containing a central aperture therein to provide communication between said valve spaces,

a float member disposed in each of said valve spaces for selectively opening and closing said valve spaces to the engine cylinder or ambient air, said float member having a cylindrical configuration with a cone shaped end portion, and

a terminal element fixed to the rear portion of the insulator and connected to the center electrode, said terminal element also containing a central bore for connecting the air passage of the center electrode with ambient air, whereby when the pressure in the engine cylinder is higher than ambient air pressure, the check valve closes the air passage to ambient air, and when the pressure in the engine cylinder is lower than ambient air pressure, the check valve opens the air passage to ambient air.

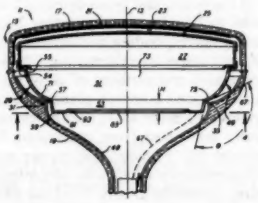
4,513,221
CRT INTERNAL SHIELDING MEANS FOR A SPUN GLASS ENVELOPE FUNNEL SECTION

John D. Robbins, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,682

Int. Cl.³ H01J *29/80, 29/86, 1/52*

U.S. Cl. 313—402 **2 Claims**



1. Internal magnetic shielding means formed for spatial positioning within the glass spun-funnel section of a CRT envelope, said spun-funnel having a substantially continuous built-up ridge of accumulated glass formed around the interior surface thereof, said shielding means being a shaped member having a substantially continuous sidewall formation with an axis therethrough characterized by a structure comprising:

a major sidewall portion formed about said axis as a flared skirt-like shaping defining a substantially full frontal opening and extending rearward in a constricted manner to a region of reduced periphery; and

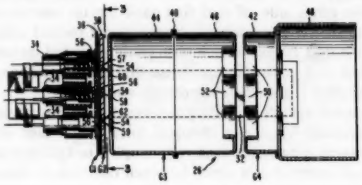
a minor sidewall portion formed about said axis as a band-like waist formation integral with and extending rearward from the reduced periphery of said flared shaping at a defined transitional region normal to said axis, said waist formation having a terminal perimeter demarcated by a continuous ledge instanding in a common plane from said perimeter toward said axis with the terminal edge thereof defining a rear opening of said member smaller than the frontal opening thereof, said transitional region between said flared and waist sidewall formations being indented toward said axis as the apex of a substantially continuous re-entrant angle, whereby at least discrete portions thereof may be spatially adjacent determinate regions of said glass ridge on said spun-funnel envelope section.

4,513,222

COLOR PICTURE TUBE HAVING RECONVERGENCE SLOTS FORMED IN A SCREEN GRID ELECTRODE OF AN INLINE ELECTRON GUN

Hsing-Yao Chen, Landisville, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 27, 1983, Ser. No. 461,584
Int. Cl.[3] H01J *29/51, 29/62*
U.S. Cl. 313—412 **16 Claims**



1. In a color picture tube having an inline electron gun including at least a screen grid electrode and an accelerating and focusing electrode, said electrodes having a plurality of apertures therethrough including at least two outer apertures in portions facing each other, said apertures in said screen grid electrode being aligned with the facing apertures in said accelerating and focusing electrode, the improvement comprising:

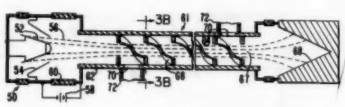
the portions of said screen grid electrode facing said accelerating and focusing electrode including two precisely located reconvergence slots formed therein which are spaced sufficiently close to and inward from said outer apertures to cause a distortion of an electrostatic field formed between said screen grid electrode and said accelerating and focusing electrode at said apertures, said reconvergence slots having a depth less than the thickness of said screen grid electrode.

4,513,223

ELECTRON TUBE WITH TRANSVERSE CYCLOTRON INTERACTION

Marvin Chodorow, Stanford, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 390,500, Jun. 21, 1982,. This application Jul. 6, 1982, Ser. No. 395,417
Int. Cl.[3] H01J *25/00*
U.S. Cl. 315—4 **26 Claims**



1. An electron tube comprising:

gun means for generating a beam of electrons having a velocity component along an axis,

means for generating velocity of said electrons transverse to said axis,

waveguide means for propagating an electromagnetic wave in the direction of said axis in energy-exchanging relation with said transverse velocity of said electrons,

means for generating a magnetic field parallel to said axis,

means for collecting said electrons after said beam emerges from said waveguide means,

means for extracting electromagnetic energy from said waveguide means,

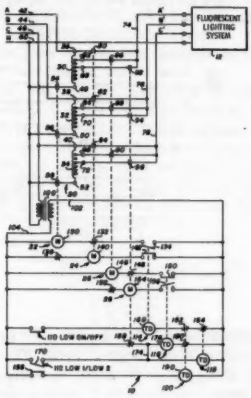
said waveguide means having a cross-sectional configuration perpendicular to said axis which configuration rotates with distance along said axis, said configuration and rotation being such that the orientation of the polarization of a transverse electric field component of a desired wave mode is locked in the same spatial relationship to said cross-sectional configuration everywhere along said waveguide.

4,513,224

FLUORESCENT-LIGHTING-SYSTEM VOLTAGE CONTROLLER

Stanley N. Thomas, Sunnyvale, Calif., assignor to Pacific Power Control, Inc., Sunnyvale, Calif.

Filed Sep. 22, 1982, Ser. No. 421,407
Int. Cl.[3] H05B *41/16*
U.S. Cl. 315—141 **6 Claims**



1. A voltage controller for connection between an AC-voltage-supplying system and a lighting system employing gaseous-discharge-type lamps, the voltage controller for coupling the full AC voltage to the lighting system for lamp starting and the voltage controller for developing a reduced voltage from the AC voltage and for coupling the reduced voltage to the lighting system during a predetermined period for power conservation, the voltage controller comprising in combination:

a neutral line;

a supply-system-hot line with said neutral line for connection to the supplying system to receive the AC voltage;

a lighting-system-hot line with said neutral line for connection to said lighting system to transmit power thereto;

a neutral-contactor means having a neutral-contact-set means;

a full-voltage-contactor means having a full-voltage-contact-set means;

a coupling means;

a transformer means including an auto-transformer-winding means having a hot-end means connected to said supply-system-hot line and selectively coupled by said full-voltage-contact-set means to said lighting-system-hot line, a neutral-end means selectively coupled by said neutral-contact-set means to said neutral line, and a tap means coupled to said lighting-system-hot line by said coupling means, said winding means for developing the reduced voltage between said tap means and said neutral-end means when said AC voltage is developed between said hot-end means and said neutral-end means; and

a contactor-switching means for causing said neutral-contact-set means to be open and said full-voltage-contact-set means to be closed for lamp starting and for causing said neutral-contact-set means to be closed and said full-voltage-contact-set means to be open during the predetermined period for power conservation, said contactor switching means being operative to open said full-voltage-

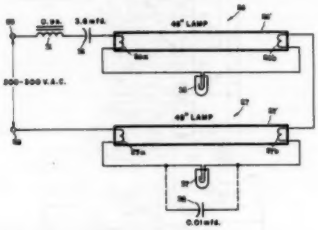
contact-set means before closing said neutral-contact set means when switching from the lamp-starting state to the energy conserving state and operative to open said neutral-contact-set means before closing said full-voltage-contact-set means when switching from said power conserving state to said lamp-starting state.

4,513,225

FLUORESCENT LAMP SERIES SYSTEM

Alfred E. Lemmers, Cleveland Heights, and Edward E. Hammer, Mayfield Village, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,088
Int. Cl.³ H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—189 **7 Claims**



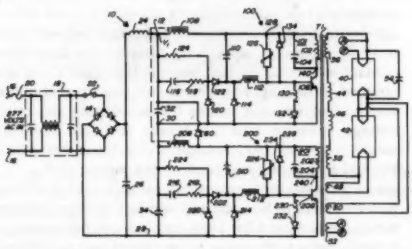
1. A fluorescent lamp lighting system for operation from an a-c voltage source in the range of about 200 to 300 volts at a frequency of about 50 or 60 hertz, comprising one or more fluorescent lamps connected to provide a total gas discharge path length of about 96 inches, cathode preheated means connected to said lamps, and ballast means connected in series combination with said gas discharge path to operate said lamps at a power consumption of less than ten watts per foot of lamp length, said series combination being adapted for connection across said a-c voltage source, said gas discharge path being contained in one or more lamp bulbs having outside diameters of about one and one-half inches, said lamp bulbs being devoid of any internal conductive starting aid material therealong and containing a gas fill of mercury vapor and a mixture of krypton and neon or argon in a volume ratio of about 80% to 20% at a pressure of about 1.5 torr.

4,513,226

ELECTRONIC BALLAST-INVERTER CIRCUIT

Elliot Josephson, Los Altos, Calif., assignor to Astec Components, Ltd., Santa Clara, Calif.

Filed Mar. 4, 1983, Ser. No. 472,153
Int. Cl.³ H05B *41/26, 41/14*
U.S. Cl. 315—219 **16 Claims**



1. An inverter circuit for powering one or more fluorescent lamps or the like comprising:

a DC voltage source including a power input terminal and a ground return terminal;

a transformer having first and second primary windings and at least one secondary winding adapted to be connected in series with a fluorescent lamp;

a first circuit including a first tank circuit having a predetermined resonant frequency, a first inductor connected in series between one side of said first tank circuit and said power input terminal and a first transistor connected to the other side of said first tank circuit operative when turned on to switchably connect said second side of said first tank circuit to an intermediate potential terminal, said first tank circuit comprising a first capacitor connected in parallel with said first primary winding;

a second circuit including a second tank circuit having a resonant frequency identical to said first tank circuit, a second inductor inductively coupled to said first inductor and connected in series between one side of said second tank circuit and said intermediate potential terminal, and a second transistor connected to the other side of said second tank circuit operative when turned on to periodically switchably connect said second side of said second tank circuit to a ground return terminal of said DC source, said second tank circuit comprising a second capacitor connected in parallel with said second primary winding;

means for generating a DC voltage offset between said first circuit means and said second circuit means such that a first portion of said DC source voltage amplitude exists between said power input terminal and said intermediate terminal and a second portion of said DC source voltage amplitude exists between said intermediate terminal and said ground return terminal; and

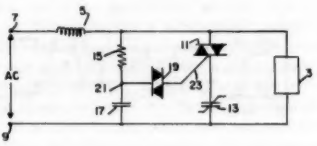
means for alternately turning on said first transistor and said second transistor at a rate determined by the resonant frequency of said first and second tank circuits.

4,513,227

HIGH INTENSITY DISCHARGE (HID) LAMP STARTING APPARATUS

William M. Labadini, Salisbury, and John A. Scholz, Danvers, both of Mass., assignors to GTE Products Corporation

Filed Jan. 10, 1983, Ser. No. 456,679
Int. Cl.³ H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—290 **8 Claims**



1. High Intensity Discharge (HID) lamp starting and operating apparatus comprising:

an inductive ballast coupled to a high intensity discharge (HID) lamp;

terminal means coupled to said ballast and to said (HID) lamp and formed for connection to a service voltage source;

timing and triggering circuit means shunting said high intensity discharge (HID) lamp including a series connected resistor and capacitor shunting said lamp, a series connected gated switch and non-linear dielectric element shunting said lamp and a bidirectional switching means coupling the junction of said series connected resistor and capacitor to the gate electrode of said gated switch.

4,513,228
CIRCUIT FOR GENERATING A SAWTOOTH-SHAPED CURRENT

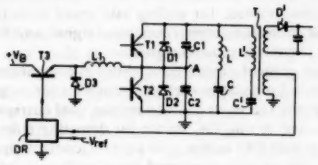
Dirk J. A. Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,715

Claims priority, application Netherlands, Apr. 8, 1981, 8101721

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—408 **13 Claims**



1. A circuit for generating a sawtooth-shaped current, having trace and retrace periods, through a coil which, during the trace period, is connected to a trace capacitor by means of a plurality of series-arranged controllable, periodically operated switches, which switches are nonconductive substantially simultaneously during the retrace period, in which retrace period the coil, the trace capacitor and a retrace capacitance are part of a resonant network the elements of which determine the duration of the retrace period and to which circuit, energy from a supply source is applied for replenishing energy losses, characterized in that a retrace capacitor is arranged in parallel with each switch, the supply source being d.c. connected in parallel with a number of series-arranged switches which is smaller than the total number of switches whereby, the voltage in operation across the trace capacitor is higher than that of the supply source.

4,513,229
REEL SERVO FOR TAPE TRANSPORT

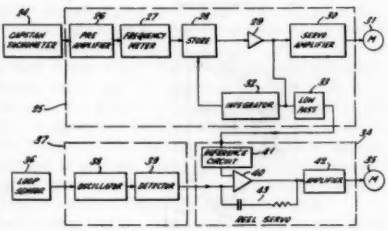
Stefan Kudelski, Le Mont-sur-Lausanne, Switzerland, assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 15, 1983, Ser. No. 533,316

Claims priority, application United Kingdom, Sep. 17, 1982, 8226570

Int. Cl.³ B65H *59/38*

U.S. Cl. 318—7 **15 Claims**



1. In a tape transport which includes a motor-driven capstan for drawing tape past a cylindrical guide drum and tape is supplied to said drum by a driven supply reel, and including means for forming a loop of tape along a tape path between the supply reel and the cylindrical guide drum, the combination comprising:

means for energising the capstan motor;

means coupled to the energising means for supplying a signal representing the energisation of the capstan motor;

means for generating a signal representative of the tension in the tape from the supply reel;

means for providing a reference signal;

means for comparing the reference signal with the signal representative of the tape tension to provide an output signal for controlling the energisation of the supply reel motor; and

means for modifying the reference signal in response to the signal representing the energisation of the capstan motor.

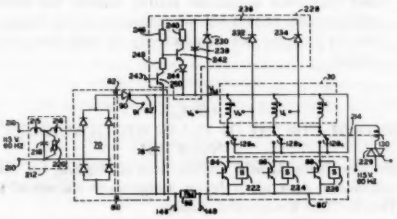
4,513,230
LAUNDERING APPARATUS, METHOD OF OPERATING A LAUNDRY MACHINE, CONTROL SYSTEM FOR AN ELECTRONICALLY COMMUTATED MOTOR, AND METHOD OF OPERATING AN ELECTRONICALLY COMMUTATED MOTOR

David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 141,267, Apr. 17, 1980, abandoned, Continuation-in-part of Ser. No. 077,556, Sep. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 802,484, Jun. 1, 1977, Pat. No. 4,169,990, which is a continuation-in-part of Ser. No. 729,761, Oct. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 482,409, Jun. 24, 1974, Pat. No. 4,005,347. This application Jul. 21, 1982, Ser. No. 400,206

Int. Cl.³ H02P *1/18*

U.S. Cl. 318—254 **82 Claims**



1. A laundering apparatus comprising:

means operable generally in a washing mode for agitating water and fabrics to be laundered therein and operable generally in a spin mode for thereafter spinning the fabrics to effect centrifugal displacement of water from the fabrics;

an electronically commutated motor including a stationary assembly having a plurality of winding stages associated therewith and adapted to be selectively commutated, and rotatable means associated with said stationary assembly in selective magnetic coupling relation with said winding stages for driving said agitating and spinning means in the washing mode operation and in the spin mode operation thereof upon the commutation of said winding stages, each of said winding stages having at least first and second terminals, said first terminals of each of said windng stages being connected at a first common point;

means for providing a plurality of first waveshapes;

means for selecting one of the first waveshapes;

means for selectively setting the maximum amplitude of the selected first waveshape, the selected first waveshape representing a profile of desired angular velocity of said rotatable means;

means for producing an effective voltage from a DC voltage in accordance with the selected first waveshape

and for commutating said winding stages by applying the effective voltage thereto in at least one preselected sequence, including a plurality of switching means for connection in series with said winding stages, respectively, and means responsive to the angular position of said rotatable means for applying commutation signals in the at least

one preselected sequence to said switching means to control their conductivity;

first diode means separately connected between said second terminal of eachof said winding stages and a second common point;

said plurality of switching means being connected between a third common point and said second terminal of each of said winding stages;

capacitor means connected between said first and second common points;

first impedance means and first transistor means for connection in series between said first and second common points;

voltage divider means and second transistor means for connection in series between said second and third common points, said voltage divider means including second and third impedance means for connection at a fourth common point coupled to said first transistor means so that the voltage at said fourth common point controls the conductivity of said first transistor means;

means for deriving a signal representative of the actual angular velocity of said rotatable means and for generating an error signal from the velocity signal and the selected first waveshape; and

means for decreasing the conductivity of said second transistor means when the error signal has a value corresponding to an excess of the actual angular velocity over the desired angular velocity determined by said selecting means and said maximum amplitude setting means, the decreased conductivity of said second transistor means being effective to increase the conductivity of said first transistor means.

4,513,231

CONTROL CIRCUIT OF PULSE WIDTH MODULATION INVERTER

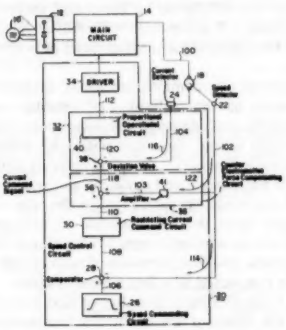
Toshitaka Kuno; Hiroshi Moribe, both of Nagoya, and Shojirou Miyamoto, Ama, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Feb. 7, 1983, Ser. No. 464,396

Claims priority, application Japan, Feb. 12, 1982, 57-21805

Int. Cl.³ H02P 5/06

U.S. Cl. 318—341 **7 Claims**



1. A control circuit of a pulse width modulation inverter, connected to a converter for converting AC power to a predetermined direct current for driving a DC motor, said control circuit comprising:

a main circuit including main transistors arranged in bridge connection and switchingly-driven to supply positive and negative driving currents to said DC motor,

a speed command circuit for supplying a speed command signal,

a speed control circuit for comparing said speed command signal from said speed command circuit with a speed detection signal from a speed detector connected to said DC motor for detecting a rotational speed of said DC motor, said speed control circuit supplying a speed command deviation signal,

a current command restricting circuit, connected to said speed control circuit, for restricting said speed command deviation signal and for supplying a restricted current command signal,

a counter electromotive force compensating circuit, connected to said speed detector and said current command restricting circuit, for adding said speed detection signal to said restricted current command signal, and for supplying a current command signal,

a current control circuit comprising a comparator circuit, connected to said counter electromotive force compensating circuit and to a current detector, said current detector connected to said DC motor for detecting a driving current of said DC motor, said current control circuit compares said current command signal with said driving current from said current detector, and supplies a current command deviation signal,

a proportional operational circuit, connected to said current control circuit, for exercising a proportional control over said driving current in accordance with said current command deviation signal from said comparator circuit and for supplying a current control signal, and

a driver, connected to said current control circuit and said main circuit of said pulse width modulation inverter, and supplying a driving current to said main circuit for PWM switchingly driving said main transistors of said main circuit,

thereby compensating for an error in current control from a counter electromotive force of said DC motor.

4,513,232

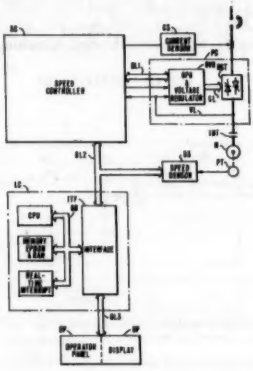
GENERAL PURPOSE AND OPTIMAL LENGTH CONTROLLER FOR CYCLIC DUTY MOTOR DRIVES

Mohammed Safiuddin, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1983, Ser. No. 498,607

Int. Cl.³ H02P 5/06; G06F 15/46

U.S. Cl. 318—341 **7 Claims**



1. A cyclic-duty motor drive system for repeatedly moving a cutting tool having mass inertia from a home position to a cutting position and back in relation to a continuous elongated member of material displaced at a predetermined constant speed, said successive cutting positions being separated along said member of material by a predetermined distance L and occurring with the duty cycle S of the motor drive, the motor drive including:

a speed controller responsive to a speed reference signal for

adjusting the speed of said motor drive in relation to said speed reference signal, comprising:

a length controller for applying to said speed controller a signal representative of a desired length L between said two positions and a signal representing a desired duty cycle;

memory means having stored therein digital data representing a standard parabolic speed profile as a function of time of standard maximum speed ω_{MAX} and a standard time interval between initial and final zero speeds on said profile;

means responsive to said length representative signal and to said duty cycle representative signal and operative with said memory means for generating, as said desired length signal and duty cycle signal, modified digital data representing a scaled profile derived from said stored digital data standard parabolic speed profile

said speed controller being responsive to said modified data for generating as a function of time said speed reference signal in relation to said scaled profile;

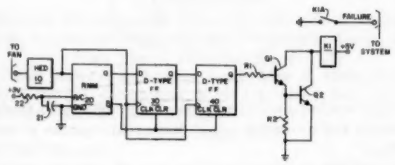
whereby said cutting tool is accelerated from zero speed to maximum speed and decelerated to zero speed in accordance with said scaled parabolic profile between said home and cutting positions.

4,513,233

PULSE MONITOR CIRCUIT FOR USE AS A FAN SPEED MONITOR

David P. Giammarrusco, Bartlett, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,260
Int. Cl.³ G05B *23/02*
U.S. Cl. 318—565 **13 Claims**



1. A magnetic pulse monitor circuit for use in a system which includes a source of periodic magnetic flux signals, said magnetic pulse monitor circuit comprising:

magnetic flux sensing means which is connected in magnetic flux proximity to said source of periodic magnetic flux signals and its operative in response to said periodic magnetic flux signals to provide corresponding periodic magnetic flux detection signals;

detection means which is connected to said magnetic flux sensing means and is operative in response to periodic magnetic flux detection signals having a frequency greater than or equal to a predetermined frequency to provide a first frequency detection signal, and which is operative in response to periodic magnetic flux detection signals having a frequency less than said predetermined frequency to provide a second frequency detection signal;

storage means which is connected to said detection means and said magnetic flux sensing means and is operative in response to said first frequency detection signal and a magnetic flux detection signal to provide a first storage signal, and which is operative in response to said second frequency detection signal to provide a second storage signal; and

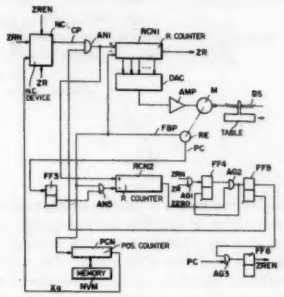
signalling means which is connected to said storage means and is operative in response to said first storage signal to provide a status signal of a first characteristic, and which is operative in response to said second storage signal to provide a status signal of a second characteristic.

4,513,234

METHOD AND APPARATUS FOR CONTROLLING ZERO-POINT RETURN OF A MOVABLE ELEMENT

Ryoichiro Nozawa, Tokyo, and Nobuyuki Kiya, Hachioji, both of Japan, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

Filed Jun. 16, 1982, Ser. No. 388,925
Claims priority, application Japan, Jun. 16, 1981, 56-92798
Int. Cl.³ G05B *11/18*
U.S. Cl. 318—594 **5 Claims**



1. A method of controlling the return of a movable element of a machine tool to a predetermined grid point by controlling movable element drive means in accordance with feedback pulses generated while said drive means is being driven to transport said movable element between grid points, comprising the steps of:

specifying a position remote from said predetermined grid point by a distance which is less than the spacing between grid points;

computing a single deviation between said specified position and a current position of the movable element;

driving, positioning and stopping said movable element at said specified position by driving said drive means on the basis of the computed deviation and the feedback pulses; and

driving said drive means, after stopping at said specified position, at reduced speed to stop said movable element at the first grid point encountered following the initiation of reduced-apeed drive, thereby stopping at said predetermined grid point after two drive periods.

4,513,235

CONTROL APPARATUS

Donald J. Acklam; David Bird, both of Lancashire, and Graham A. Hill, Warton, all of England, assignors to British Aerospace Public Limited Company, London, England

Filed Jan. 24, 1983, Ser. No. 460,264
Claims priority, application United Kingdom, Jan. 22, 1982, 8201907; Oct. 22, 1982, 8230312
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—685 **3 Claims**

1. A control device for enabling an operator to control associated apparatus to which, in use, the control device is connected, the control device comprising:

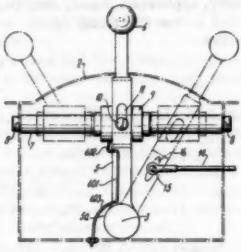
a fixed support member;

an elongate control lever pivotably connected to the support member for being pivotably moved by an operator with respect to the support member;

output means connected to the control lever and operable for transmitting to said associated apparatus control signals indicative of the position of the control member relative to the support member;

a linear electrical stepper motor including a fixed elongate stator supported by the support member and a mover

supported by the stator for linear movement therealong, said control lever being pivotably connected to said motor mover at a position on the control lever spaced from the position at which it is pivotably connected to the support member for said pivotable movement of the control lever to be accompanied by said linear movement of the motor mover; and



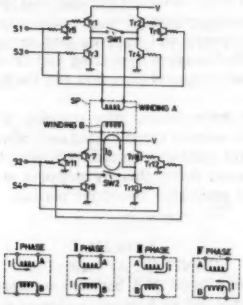
motor energization means which is connected to said stepper motor and which is operable for energizing said motor to generate, at least while said control member is at one or more discrete positions in its range of movement relative to the support member, an attractive force between the stator and mover of the motor tending to resist manual movement of the control lever.

4,513,236

CONTROL METHOD FOR STEPPING MOTOR

Noriyuki Kikukawa, Yokohama, and Yasuaki Yamada, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,183
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **15 Claims**



1. A control method for controlling the operation of a stepping motor having a rotor, said method comprising the steps of

energizing plural coils in succession to move the stepping motor rotor to a target point, and

coupling two coils to one another, other than a coil being energized, to define a closed circuit containing said two coils, said coupling step comprising the step of grounding said two coils.

4,513,237

ENERGY EFFICIENT MULTI-PHASE DUAL VOLTAGE ELECTRIC MOTOR

Horace B. Ford, 715 Nassau Bay II, Granbury, Tex. 76048

Filed Mar. 29, 1984, Ser. No. 594,688
Int. Cl.³ H02P *7/48*
U.S. Cl. 318—768 **10 Claims**

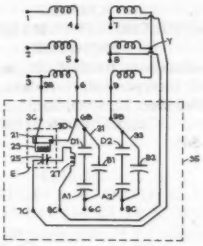
1. A system for use with an A-C three phase motor for allowing said motor to be connected for operation on one phase power, said motor having a Y connected stator winding comprising three windings, each winding comprising first and second winding sections, each winding section having two ends, said first winding sections having first ends connected together at a common point, said second winding sections having first ends connectable to line voltage, two of said first winding sections having ends opposite their first ends adapted to be connected to line voltage or to the ends of two of said second windings opposite their first ends, comprising:

first coil means for controlling two normally open contact means,

a first pair of leads coupled to opposite ends of said first coil means and connectable to the ends of said two of said first winding sections opposite their first ends thereof,

a second coil means for controlling a normally closed contact means connected to one of said first pair of leads,

a second pair of leads coupled to opposite ends of said second coil means and connectable across the other of said second winding sections such that when line voltage is applied to said three windings, said first coil means closes said two normally open contact means and as the motor RPM increases, a counter EMF voltage on said second pair of leads causes said second coil means to open said normally closed contact means thereby allowing said two normally open contact means to open,



first and second circuits each of which comprises a starting circuit and a running circuit connected together in parallel,

each starting circuit comprising one of said two pairs of normally open contact means and a starting capacitor,

each of said running circuits comprising a running capacitor,

one end of said first circuit being connectable to the end of said other of said second winding sections opposite its first end thereof which is adapted to be connected to line voltage,

one end of said second circuit being connectable to the end of the other of said first winding sections opposite its first end thereof which is connected to said common point,

for operation of said motor at a first line voltage level, the other end of said first circuit being connectable to the ends of said two of said second winding sections opposite their first ends thereof which are adapted to be connected to line voltage and the other end of said second circuit being connectable to line voltage,

for operation of said motor at a line voltage level greater than said first line voltage level, the other ends of said first and second circuits being connectable together.

4,513,238

AUTOMATIC BATTERY CHARGER WITH THERMAL CONTROL

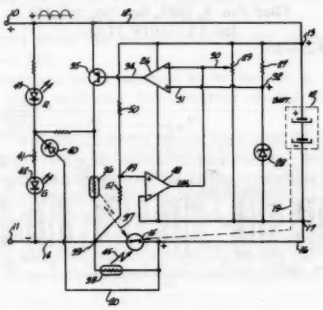
John M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed May 13, 1983, Ser. No. 494,562
Int. Cl.³ H02J *7/00*
U.S. Cl. 320—23 **8 Claims**

1. A battery charger for removable rechargable batteries,

the charger having fast charge and slow charge modes comprising

charging circuit means for providing to a removable battery to be charged charging current either at a fast charge rate or a slow charge rate,



oscillator circuit means for switching said charging circuit means between said fast charge rate and slow charge rate automatically prior to insertion of a battery to allow a user to select a desired charging mode, and

indicator means in said charger for indicating to a user whether the charger is operating at the fast charge rate or the slow charge rate.

4,513,239

APPARATUS FOR CONTROLLING A CHARGING GENERATOR

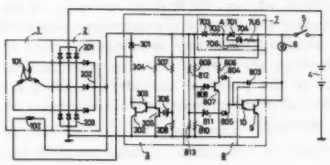
Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 7, 1983, Ser. No. 472,826

Claims priority, application Japan, Mar. 9, 1982, 57-38917; Mar. 9, 1982, 57-38918; Mar. 9, 1982, 57-38919; Mar. 23, 1982, 57-47926; Mar. 23, 1982, 57-47928

Int. Cl.³ H02J 7/14

U.S. Cl. 322—99 **14 Claims**



1. An apparatus for controlling a charging generator having armature coils and a field coil, comprising:

(a) a rectifier for rectifying an a.c. output induced in said armature coils, said rectifier having a first rectifier output terminal, a second rectifier output terminal, and a ground terminal;

(b) a storage battery chargeable by an output from said first rectifier output terminal;

(c) a voltage regulator for turning a current flowing form said second rectifier output terminal to the field coil on and off to control an output voltage of the charging generator so as to be maintained at a preset value;

(d) a switch;

(e) an indicator connected between said storage battery and said ground terminal through said switch;

(f) a switch element connected in series between said indicator and said ground terminal;

(g) diagnostic means for detecting malfunctions of the charging generator for rendering said switch element conductive; and

(h) a switch unit connected between said switch and said second rectifier output terminal and comprising a thyristor having a gate and a zener diode connected to said gate.

4,513,240

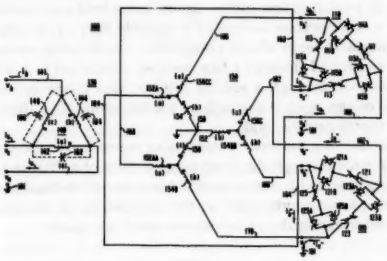
METHOD AND APPARATUS FOR SELECTIVE CANCELLATION OF SUBSYNCHRONOUS RESONANCE

Thomas H. Putman, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1983, Ser. No. 502,374

Int. Cl.³ G05F 1/70

U.S. Cl. 323—210 **18 Claims**



1. An apparatus for the selective cancellation of harmonic frequencies of current of a multiphase dynamic stabilizer for a multiphase AC electrical network, comprising:

plurality of multiphase dynamic stabilizer means for providing electrical stabilization to the electrical network;

control means producing a control signal for controlling the operation of the stabilizer means on a periodic basis to produce the stabilization; and

transformer means electrically interconnected intermediate the phases of the electrical network and the phases of each of the stabilizer means, the transformer means rotating the phases of the selected harmonic frequencies of currents produced in each of the stabilizer means with respect to those of the other stabilizer means such that the selected harmonic frequencies are substantially cancelled in each of the stabilizer means.

4,513,241

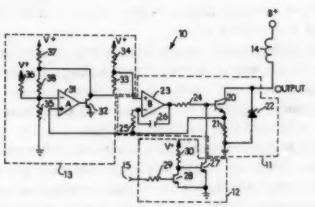
FOLDBACK CURRENT LIMITING DRIVER

Melvin B. Bowman, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 1, 1983, Ser. No. 481,426

Int. Cl.³ G05F 1/46

U.S. Cl. 323—285 **8 Claims**



6. A voltage driving circuit having foldback current limiting characteristics comprising:

an input terminal means for receiving a logic signal;

a current limiting circuit means for restricting current through a load to a predetermined maximum value and coupled to said input terminal means;

a latching transistor means coupled to the input of said current limiting circuit means;

a comparator means having an output coupled to the base of said latching transistor means, a negative input to said comparator coupled to a reference voltage, and a positive input to said comparator means coupled to said current limiting circuit and receiving a signal indicative of the magnitude of load current for latching the load current at a level lower than said predetermined maximum value until a logic signal is applied to said input terminal means to turn off the load current, thereby providing lower power dissipation in the load and a faster load turnoff time as a result of less energy stored in the load and resulting in a more precise control of a variable duty cycle output;

a negative input of said comparator means being connected to ground through a first resistor, connected to a voltage source through a second resistor, and connected to the voltage source through a combination of a third and fourth resistor; and

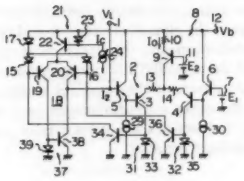
said latching transistor means being connected to the voltage source through the series combination of a fifth and sixth resistor and is also connected to a node intermediate said third and fourth resistor, the magnitudes of the resistors determining the switching points of the circuit.

4,513,242

ELECTRONIC IMPEDANCE DEVICE FOR PROVIDING A VARIABLE IMPEDANCE

Fumihiko Yokogawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 429,316
Claims priority, application Japan, Oct. 1, 1981, 56-156396
Int. Cl.³ H03H *11/00*
U.S. Cl. 323—352 **10 Claims**



1. An electronic impedance device, comprising in combination an input terminal to be connected to a source of a signal voltage;

differential voltage-to-current converting means having a relatively high input impedance and operative to convert said signal voltage into two differential output currents variable with the signal voltage;

a pair of p-n junction elements connected to said voltage-to-current converting means;

current transfer means comprising a pair of current mirror networks connected between said voltage-to-current converting means and said p-n junction elements, respectively, and operative to transfer said differential output currents to said p-n junction elements;

a differential current amplifier circuit which is responsive to voltages built up respectively across said p-n junction elements and which has an output terminal at which the amplifier circuit is to produce its output current; and

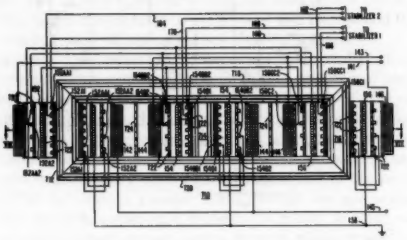
feedback means providing connection from the output terminal of said amplifier circuit to said input terminal for permitting the output current of the amplifier to be fed back to said input terminal.

4,513,243

CORE FORM TRANSFORMER FOR SELECTIVE CANCELLATION OF SUBSYNCHRONOUS RESONANCE

Paul G. Novak, Hubbard, Ohio, and Theodore R. Specht, Sharon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1983, Ser. No. 502,379
Int. Cl.³ H01F *33/00*
U.S. Cl. 323—361 **5 Claims**



1. A three phase core form transformer, comprising:

a three legged magnetic core;

a plurality of primary windings corresponding to the phases;

two auxiliary secondary windings per phase, wound to provide first and second common bifilar portions;

a plurality of principal secondary windings corresponding to the number of primary windings;

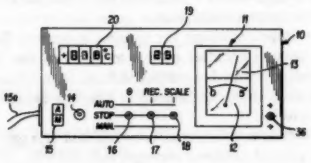
the first common bifilar portion, the principal secondary winding, the second common bifilar portion, and the primary winding being coaxial and radially adjacent, in the recited order, starting from each leg of the magnetic core, the primary windings being connected in delta, the principal secondary windings and auxiliary secondary windings being connected in a forked wye wherein one auxiliary secondary winding of each of the other two phases is electrically connected to a free end of each of the wye connected principal secondary windings resulting in all three phases being present in each combination of principal secondary windings and auxiliary secondary windings, wherein the leakage reactance of the principal secondary winding and the common leakage reactance of the auxiliary secondary windings attached thereto for each phase are positive in value with the leakage reactance of the principal secondary winding being about twice that of the common leakage reactance of the auxiliary windings.

4,513,244

MEASURING AND RECORDING APPARATUS

Claude le Henand, 15bis, rue des Meuniers, 45300 Pithiviers, France

Filed May 18, 1981, Ser. No. 264,846
Int. Cl.³ G01D *9/00, 15/16*
U.S. Cl. 324—51 **5 Claims**



1. A measuring and recording apparatus for testing the

operation of a home electrical appliance comprising, in a common housing:

multiscale electrical current displaying and recording means for providing a permanent record on a paper strip having an electrical motor for unwinding said strip,

a power line for delivery of electrical power to the home electrical appliance to be tested,

a current probe for measurement of the current in said power line,

a temperature probe adapted to be located in said home electrical appliance for detection of the temperature thereof,

digital temperature meter means associated with said temperature probe and provided with memory means operable to store a maximum value of the temperature sensed by said temperature probe,

electrical circuit means for operating said motor in response to detection of a current above a predetermined level by said current probe,

and change over means for alternately delivering signals representative of the current sensed by said current probe and of the temperature sensed by said temperature probe to said current recorder, whereby a permanent record of the current and temperature is obtained.

4,513,245

DC CURRENT DETECTOR

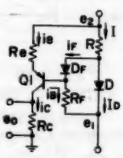
Tatsuo Yokoyama, Kakogawa, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

Filed Jul. 14, 1982, Ser. No. 398,383

Claims priority, application Japan, Jul. 15, 1981, 56-110275

Int. Cl.³ G01R *19/22, 1/30*

U.S. Cl. 324—119 **9 Claims**



1. A DC current detector comprising:

a current detecting resistor having first and second terminals;

a first diode connected to the first terminal of said current detecting resistor in series with said current detecting resistor in a forward direction relative to a current to be detected;

an emitter resistor connected to the second terminal of said current detecting resistor;

a second diode connected to the first terminal of said current detecting resistor;

a transistor having an emitter connected to said emitter resistor, having a base connected to said second diode at a first node, and having a collector;

a collector resistor having a first terminal connected to the collector of said transistor, having a second terminal, and having a detected voltage across the first and second terminals of said collector resistor; and

an equalizing resistor, operatively connected to said first node and said first diode, for equalizing the base-emitter voltage of said transistor and the forward voltage of said second diode.

4,513,246

CLAMP-ON AMMETER

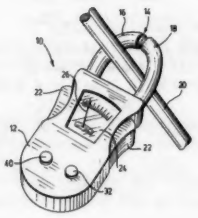
Aurele Blain, 23 Allanbrooke Dr., Islington, Ontario, Canada M9A 3N7

Filed Sep. 23, 1982, Ser. No. 422,223

Claims priority, application Canada, Sep. 16, 1982, 411606

Int. Cl.³ G01R *19/00*

U.S. Cl. 324—127 **8 Claims**



1. A device for measuring a current of magnitude less than a predetermined maximum value, flowing in a conductor comprising:

a magnetic locatable around the conductor;

residual flux reset means which can be momentarily activated to induce in the core a magnetic flux that produces in the magnetic core a residual magnetic flux substantially identical to the residual magnetism which is produced in the core when unmagnetized by a direct current of the predetermined maximum value flowing in a conductor around which the core is located;

offset flux generating means for inducing in the magnetic core an offsetting magnetic flux of substantially identical magnitude but of opposite direction to the residual magnetic flux;

indicator means for indicating the magnitude of the magnetic flux in the magnetic core;

whereby, with the residual flux resetting means momentarily activated to produce the residual magnetic flux in the magnetic core and with the magnetic core then located around the conductor, the indicator means respond to the magnetic flux induced in the core by current in the conductor and the signal generated by the indicator means is indicative of the magnitude of any DC current flowing in the conductor of magnitude less than the predetermined maximum value.

4,513,247

METHOD FOR RECORDING THREE-DIMENSIONAL NUCLEAR MAGNETIC RESONANCE SPECTRA AND A DEVICE FOR CARRYING OUT THE SAME

Richard R. Ernst, Winterthur, Switzerland, assignor to Spectrospin AG, Switzerland

Filed Nov. 1, 1982, Ser. No. 438,182

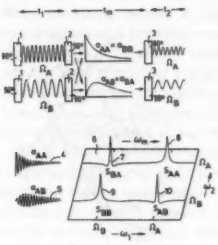
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143626

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **2 Claims**

1. A method for recording three-dimensional nuclear magnetic resonance spectra in which the nuclear spin system to be investigated is excited by three successive 90° pulses applied at intervals and an interferogram obtained after application of the third 90° pulse is subjected to Fourier analysis, in which further a plurality of such measurements is taken with different intervals between the first and the second 90° pulse known as the the evolution period t_1 and selected parameters of the resonance lines obtained by the Fourier analysis are stored as instantaneous values of an additional interferogram and subjected to a second Fourier analysis, and in which finally the said measurements are taken for different time intervals between the second and the third pulse known as the mixing time

t_m to detect the variations with time of the selected parameters of the resonance lines determined by the two-fold Fourier transformation, characterized in that each time the measurement is repeated with a varied evolution period t_1, the mixing time t_m is simultaneously varied proportionally to the evolution period so as to cover a region of the mixing time of interest



with the given number of measurements taken with different evolution periods, and that the transient amplitude variation of the resonance lines is determined either from the shape of the obtained resonance lines or by reverse transformation of the individual resonance lines into the time domain along the frequency axis corresponding to the evolution period and mixing time, t_1, t_m respectively.

4,513,248

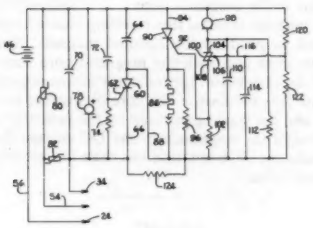
FLUID CONDUCTIVITY SENSOR

Francis M. Miller, Snyder, N.Y., assignor to Conax Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 207,340, Nov. 17, 1980, Pat. No. 4,382,231. This application Feb. 1, 1983, Ser. No. 462,913

Int. Cl.³ G01N *27/02*

U.S. Cl. 324—439 **24 Claims**



1. A circuit for activating a device in response to a predetermined condition in the electrical conductivity of a fluid comprising:

(a) electrode means adapted to be exposed to said fluid;

(b) a conductivity sensing circuit having an input operatively connected to said electrode means and being responsive to a predetermined condition of the conductivity of said fluid, said circuit including energy storage means for storing electrical energy building up when said electrode means is exposed to an electrically conductive fluid;

(c) a current conducting device activated in response to electrical energy of a predetermined minimum magnitude being applied thereto; and

(d) circuit means connected to said conductivity sensing circuit and to said current conducting device;

(e) said circuit means having a first portion operative in response to said predetermined condition of the conductivity of said fluid as sensed by said conductivity sensing circuit for applying to said device electrical energy of sufficient magnitude to activate said device;

(f) said circuit means having a second portion responsive to a predetermined level of energy in said energy storage means when the conductivity of said fluid is less than said predetermined condition for causing flow of current through said device in a manner applying to said device electrical energy having less than said predetermined minimum magnitude required to activate said device;

(g) whereby a build-up of energy on said energy storage means in response to fluid having a conductivity less than said predetermined condition is removed from said energy storage means and conducted through said device without activating said device so as to prevent premature activation of said device.

4,513,249

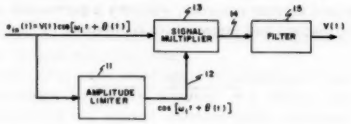
METHOD AND APPARATUS FOR SIGNAL DETECTION, SEPARATION AND SUPPRESSION

Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193

Division of Ser. No. 32,405, Apr. 23, 1979, Pat. No. 4,328,591. This application Mar. 12, 1982, Ser. No. 357,576

Int. Cl.³ H04B *7/12*; H04L *1/04*; H03K *9/02*

U.S. Cl. 328—150 **6 Claims**



1. An envelope detector for an input signal of frequency ω comprising:

an amplitude limiter for providing an amplitude limited replica of the input signal;

means for multiplying said replica and the input signal; and

means for filtering the product of said multiplying means to pass all frequencies that make up the envelope including DC and block all frequencies that make up a component in said product centered at the frequency 2 ω.

4,513,250

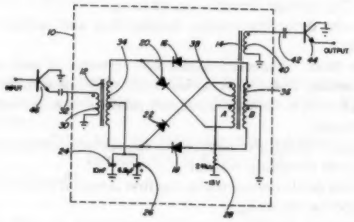
SIGNAL CUBER

Stephen G. Harman, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 31, 1983, Ser. No. 499,309

Int. Cl.³ H03B *1/04*; H03F *1/32*

U.S. Cl. 328—163 **8 Claims**

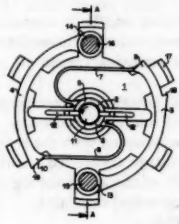


1. A signal cuber comprising a split-ring mixer having an input, an output, and two ports at which in response to an input signal applied to the input of the mixer there is produced a signal having a frequency component at the second harmonic of the input signal, and means for unequally terminating said ports to reflect at least part of said frequency component back into the mixer, thereby to produce a frequency component at the third harmonic of the input signal at the output of the mixer.

4,513,251
MILLER COMPENSATION FOR AN OPERATIONAL AMPLIFIER

Robert L. Vyne, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed May 13, 1983, Ser. No. 494,148
Int. Cl.³ H03F 1/14
U.S. Cl. 330—292 7 Claims

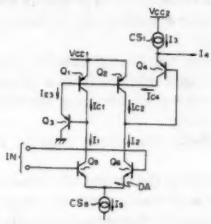


1. An operational amplifier for providing load current to an output terminal, comprising:
an input amplifier stage;
an output amplifier stage including first and second NPN output transistors each having base, emitter and collector terminals, said first NPN output transistor having an emitter coupled to the output terminal for conducting load current thereto and said second NPN output transistor having a collector coupled to said output terminal for sinking a load current therefrom;
a second amplifier stage including at least a first emitter-follower transistor coupled between the output of said input stage and the base of said second NPN output transistor;
a first capacitor coupled between the output of said input stage and said output terminal for establishing a frequency stability loop and broad banding the frequency response of said second stage; and
a second capacitor coupled between the base of said second NPN transistor and said output terminal, said first capacitor providing frequency compensation for said frequency stability loop established by said first capacitor.

4,513,252
ACTIVE LOAD CIRCUIT

Yoshiaki Sano, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1983, Ser. No. 561,966
Claims priority, application Japan, Dec. 25, 1982, 57-233262
Int. Cl.³ H03F 3/45
U.S. Cl. 330—257 3 Claims

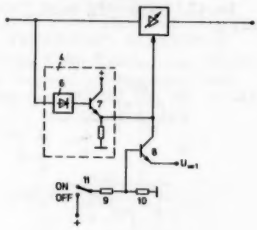


1. An active load circuit, comprising:
first and second transistors each having an emitter connected to a voltage source and each having a collector and a base;
a third transistor having an emitter connected to the bases of said first and second transistors and a base connected to one of the collectors of said first and second transistors, causing equal collector currents to flow in said first and second transistors;
a fourth transistor having a collector connected to the emitter of said third transistor, a base connected to the other of the collectors of said first and second transistors, and an emitter; and
a constant current source connected to the emitter of said fourth transistor.

4,513,253
ELECTRONIC AMPLIFIER HAVING A TRANSMISSION FACTOR THAT IS VARIABLE BY MEANS OF A CONTROLLABLE VOLTAGE, SPECIFICALLY AN EXPANDER

Ernst F. Schröder, Hanover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,631
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150536
Int. Cl.³ H03G 3/20
U.S. Cl. 330—278 9 Claims



1. An electronic amplifier circuit, particularly an expander circuit, comprising in combination: an amplifier having a transmission factor which can be varied by means of a control voltage, said amplifier having a signal input, a signal output and a control voltage input; control circuit means, responsive to the signal in the transmission path of said amplifier, for generating a variable control voltage; a source of fixed control voltage; switching circuit means for applying said variable control voltage to said control input of said amplifier when in a first condition and for applying said fixed control voltage to said control input of said amplifier when in a second condition; and means, responsive to the condition of said switching circuit means, for reducing the output voltage of said control circuit means when said switching circuit means is in said second condition.

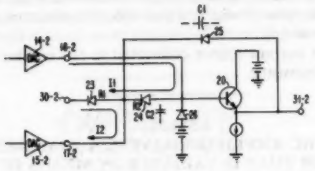
4,513,254
INTEGRATED CIRCUIT FILTER WITH ADJUSTABLE CHARACTERISTICS

Jerome D. Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 16, 1983, Ser. No. 495,311
Int. Cl.³ H03F 1/34
U.S. Cl. 330—294 10 Claims

1. An adjustable filter having an input terminal and an output terminal and at least one control terminal, said filter comprising first and second resistor elements, first and second capacitor elements, an amplifier element, and means interconnecting said elements between said input and output terminals to define a SALLEN-KEY type filter configuration, said filter being formed on a semiconductor chip as an integrated circuit having a transistor amplifying device as said amplifier element, a first pair of diodes interconnected as said first and second resistor elements, said control terminal being connected between the base of said transistor amplifying device and said diode corre-

sponding to one of said resistor elements whereby the value of the first and second resistor elements may be adjusted in accordance with an external control current supplied to said control terminal to adjust the cutoff frequency of said filter.



4,513,255

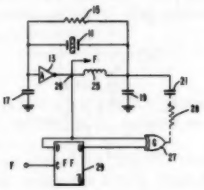
PHASE LOCKED CRYSTAL OSCILLATOR IMPLEMENTED WITH DIGITAL LOGIC ELEMENTS

William H. Terbrack, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 25, 1983, Ser. No. 461,099

Int. Cl.[3] **H03B** *5/32;* **H03L** *7/08*

U.S. Cl. 331—1 A **3 Claims**



1. A quartz crystal time-based oscillator circuit adapted to phase-lock onto a square wave reference frequency to produce an oscillator signal, said oscillator circuit including a quartz crystal having a single natural resonant frequency and a tuning circuit having reactive elements interconnectable into first and second predetermined electrical circuit configurations operative to set said oscillator to operate at first and second predetermined frequencies respectively, said oscillator circuit being characterized by digital control means for alternately switching said tuning circuit into its first and second configurations in response to reversals in the relative phases of said reference frequency and said oscillator signal, said control means includes a flip flop and a logic gate, said logic gate having its output connected to said tuning circuit, one of its inputs connected to respond to the oscillator signal and another of its inputs connected to respond to an output of said flip flop, said flip flop having a data input and a clock input, one connected to respond to said oscillator signal and the other connected to respond to said reference frequency.

4,513,256

SWEPT FREQUENCY SIGNAL GENERATOR

Takenori Kurihara, Gyoda; Shigeki Tojo, Musashino, and Yohei Hirakoso, Gyoda, all of Japan, assignors to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 508,933

Claims priority, application Japan, Jul. 5, 1982, 57-117328

Int. Cl.[3] **H03B** *23/00;* **H03L** *7/12*

U.S. Cl. 331—4 **11 Claims**

1. A swept frequency signal generator comprising:

a sweep voltage generator for generating a sweep voltage;

sweep stop adjusting means connected to the sweep voltage generator, for adjusting the amplitude of said sweep voltage to a first selected set value corresponding to the stop frequency of said sweep;

sweep polarity inverting means connected to the sweep voltage generator, for inverting the sweep direction of said sweep voltage;

sweep start adjusting means connected to the sweep polarity inverting means, for adjusting the amplitude of the inverted sweep voltage to a second selected set value corresponding to the start frequency of said sweep;

a first summing circuit connected to the sweep start and stop adjusting means, for summing the adjusted sweep voltages;

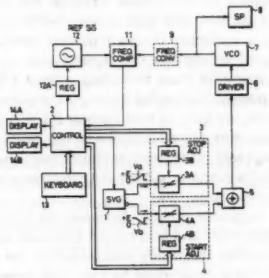
a voltage controlled oscillator connected to the first summing circuit and controlled in oscillation frequency by the output of the summing circuit to provide a frequency sweep;

a reference signal generator for producing a reference signal with a selected reference frequency;

comparing means coupled with the reference signal generator and the voltage controlled oscillator, for comparing the frequencies of the reference signal and the output of the voltage controlled oscillator;

a controller including

means for selectively setting said first and second set values of the sweep start and stop frequencies into the reference signal generator,



means for changing the respective first and second set values set in the sweep start and stop adjusting means to cause each respective frequency of the reference signal to agree with the respective output of the voltage controlled oscillator according to the output of said comparing means,

means for setting the sweep voltage generator in any mode of operation selected from a sweep start state, a reset state, a sweep stop holding state and a repetitive sweep mode state,

means for checking the output state of the comparing means,

means for controlling the setting of the sweep start adjusting means in accordance with the output state of the comparing means for bringing the oscillation frequency of the voltage controlled oscillator into agreement with the sweep start frequency, and

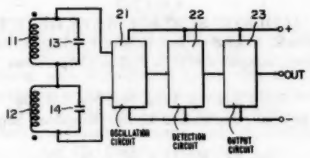
means for controlling the setting of the sweep stop adjusting means to bring the oscillation frequency of the voltage controlled oscillator into agreement with the sweep stop frequency; and

input means for setting and inputting data for said frequencies and modes of operation into the controller.

4,513,257
PROXIMITY SWITCH WITH OPPOSITELY POLARIZED COILS

Kiyoshi Miyamoto, Nagaokakyo, and Kenji Ueda, Otsu, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 1, 1982, Ser. No. 445,850
Claims priority, application Japan, Dec. 3, 1981, 56-195455; Dec. 17, 1981, 56-189180[U]
Int. Cl.[3] G01P *13/00*; H01F *27/38*
U.S. Cl. 331—65 6 Claims

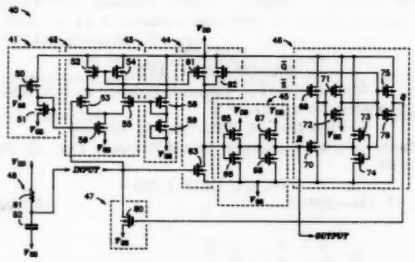


1. A proximity switch comprising
a detection coil,
a first capacitor connected in parallel with the detection coil for forming a resonant circuit,
an auxiliary coil,
a second capacitor connected in parallel with the auxiliary coil for forming a resonant circuit,
an oscillation circuit connected to said detection and auxiliary coils which are connected in series and in reverse winding directions, and
an output circuit connected to the oscillation circuit for detecting variations in the output of the oscillation circuit, said second capacitor having a capacitance larger than that of the first capacitor so that said second capacitor has a reduced low impedance at an oscillation frequency determined by the detection coil and the first capacitor.

4,513,258
SINGLE INPUT OSCILLATOR CIRCUIT

Michael J. Jamiolkowski, and Jules D. Campbell, Jr., both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1983, Ser. No. 510,145
Int. Cl.[3] H03K *3/354*, *4/50*
U.S. Cl. 331—111 13 Claims

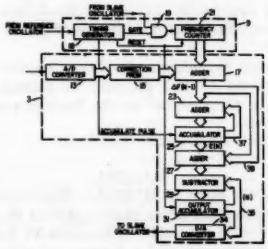


1. A single input oscillator circuit for providing an oscillating output signal in response to the presence of an input signal, comprising:
means for receiving an input signal;
a differential amplifier having a first input coupled to the means for receiving the input signal, a second input coupled to a reference voltage, and first and second outputs, for providing first and second output signals which are proportional to the difference between the reference voltage and the input signal;
reference voltage means connected to the second input for providing the reference voltage;
a gain stage with variable bias having an input coupled to the means for receiving the input signal, a first bias control terminal coupled to the second output of the differential amplifier, a second bias control terminal, and an output for providing the oscillating output signal;
latch means having a first input coupled to the first output of the differential amplifier, a second input coupled to the output of the gain stage, a first output coupled to the second bias control terminal, and a second output, for latching an output signal at a predetermined level in response to the level of the signals at the first and second inputs thereof; and
discharge means coupled between the means for receiving the input signal and a reference potential node, for selectively coupling the input of the oscillator circuit to the reference potential node in response to the output of the latch means.

4,513,259
CLOSED LOOP TEMPERATURE COMPENSATED FREQUENCY REFERENCE

Marvin E. Frerking, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1982, Ser. No. 452,641
Int. Cl.[3] H03L *1/00*
U.S. Cl. 331—176 8 Claims



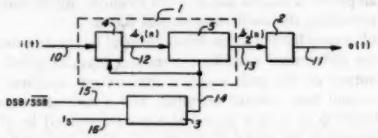
1. A closed loop frequency reference comprising:
controllable oscillator means for generating a first frequency signal in response to a control signal;
reference oscillator means for generating a second frequency signal;
comparator means for comparing the first frequency signal with the second frequency signal to obtain a composite signal; and
error signal generator means for generating the control signal during a selected period of time, said error signal generator means including:
frequency averaging means for averaging the first frequency signal between a preceding sample time and a current sample time representing a sample interval;
first accumulator means for accumulating frequency error up to the current sample time;
divisor means for obtaining a quotient of the accumulated frequency error over the sample interval;
summing means for summing the quotient with the averaged first frequency to obtain a weighted frequency error; and
subtractor means for subtracting the weighted frequency error from a previous correction factor to produce a new correction factor at the output of the subtractor means as the control signal.

4,513,260

PROGRAMMABLE FREQUENCY CONVERTING FILTER

Lawrence H. Ragan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1977, Ser. No. 758,365
Int. Cl.[3] H03H 15/02, 17/06
U.S. Cl. 333—165 12 Claims



1. A programmable frequency converting filter having a plurality of selectable operating frequency modes, said filter comprising:

a charge transfer device transversal filter and a frequency band selector;

said frequency band selector having

at least one control lead for receiving a logic signal,

logic circuitry means provided therein for selecting a frequency mode from the plurality of operable frequency modes in response to the logic signal received thereby to generate clock signals corresponding to the selected frequency mode, and

an output clock lead on which the generated clock signals of a frequency unique to the selected mode are transmitted; and

said transversal filter having

inputs coupled to the output clock lead of said frequency band selector for receiving said clock signals, and

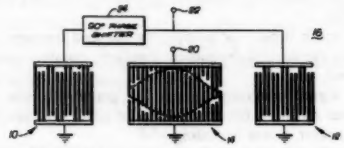
an output providing a plurality of passbands with each passband of said plurality of passbands having a width proportional to the frequency of said clock signals.

4,513,261

LOW-LOSS ACOUSTIC WAVE FILTER DEVICE

Kuo-Hsiung Yen, Manhattan Beach; Robert B. Stokes, Torrance; Kei-Fung Lau, Harbor City; Alvin M. Kong, and Reynold S. Kagiwada, both of Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 12, 1983, Ser. No. 493,917
Int. Cl.[3] H03H 9/145, 9/64
U.S. Cl. 333—194 9 Claims



1. An acoustic wave filter comprising:

a substrate of piezoelectric material;

a symmetric electroacoustic output transducer disposed on said substrate;

a pair of electroacoustic input transducers disposed on said substrate at equal distances on opposite sides of said output transducer, one of said input transducers being symmetric and the other being antisymmetric, the two having transfer functions that differ by a ninety-degree angle and having an aperture substantially equal to that of the output transducer; and

ninety-degree phase shifting means coupled to one of said input transducers, to compensate for the ninety-degree phase shift introduced by said antisymmetric input transducer;

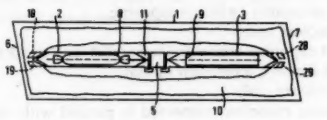
whereby signals reflected from said output transducer to said antisymmetric input transducer and back again will return with a 180-degree phase shift and will thereby cancel signals reflected from said output transducer to said symmetric input transducer and back again, and whereby the cancellation effect is relatively independent of frequency.

4,513,262

ACOUSTIC SURFACE WAVE DEVICE

John Schofield, Coulsdon, and Robert F. Milsom, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1983, Ser. No. 531,806
Claims priority, application United Kingdom, Sep. 15, 1982, 8226282
Int. Cl.[3] H03H 9/64, 9/145, 9/30
U.S. Cl. 333—194 7 Claims



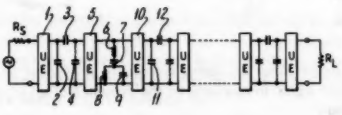
1. An acoustic surface wave device comprising a piezoelectric substrate for propagating acoustic surface waves at a surface thereof and an acoustic surface wave transducer formed on said surface to launch or to receive acoustic surface waves at said surface along a propagation direction parallel to the axis of the transducer, in which said transducer includes at least one interdigital array of two overlapping sets of electrodes with each set connected to one of a pair of opposite bus bars, characterized in that the overall width of an interdigital array between the outer boundaries of a said pair of bus bars measured in a direction at right angles to the acoustic surface wave propagation direction is so determined, in relation to the wavelength λ_c at the center frequency f_c of the acoustic surface wave pass-band of the transducer, and in relation to the electrode distribution, that a said interdigital array functions as an acoustic surface waveguide which will only propagate and transduce a single acoustic surface wave guided energy mode which is symmetrical about the central propagation axis of the array.

4,513,263

BANDPASS FILTERS

Brian J. Minnis, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,684
Claims priority, application United Kingdom, Dec. 24, 1981, 8138960
Int. Cl.[3] H01P 1/203
U.S. Cl. 333—204 14 Claims



1. A bandpass filter comprising portions of triple plate strip transmission line each having a length equal to a quarter of a wavelength at the center frequency of the stop band which is immediately above the lowest frequency pass band of the filter,

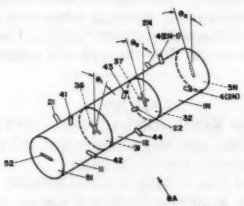
said filter comprising a cascade of said portions between two ports, said portions connecting series and shunt filter elements to form a succession of filter sections, said succession of sections comprising sections of a first type each including at least one series filter element and at least one shunt filter element, said elements being capacitive at frequencies below said center frequency of said stop band, and said succession comprising at least one section of a second type, each section of said second type being connected between two sections of the first type, said second type of section comprising an open circuit shunt stub formed from four of said portions having a combined path length equal to said wavelength.

4,513,264

BANDPASS FILTER WITH PLURALITY OF WAVE-GUIDE CAVITIES

James B. Dorey, and Wai-Cheung Tang, both of Kitchener, Canada, assignors to Com Dev Ltd., Cambridge, Canada

Filed Dec. 13, 1982, Ser. No. 448,969
Claims priority, application Canada, Aug. 25, 1982, 410124
Int. Cl.³ H01P *1/16, 1/208*
U.S. Cl. 333—212 **12 Claims**



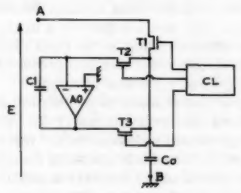
1. A bandpass filter comprising a plurality of cascaded waveguide cavities with inter-cavity coupling means, said filter having an input reference mode, at least one of said cavities being rotated with respect to said reference mode, thereby causing quasi-orthogonal coupling structures to be introduced into said cavities, each cavity having a length equal to n times the half-guide wave length at a centre frequency of the filter, where n is an integer and corresponds to the third mode index of a TE mode micro-wave to be transmitted.

4,513,265

3-PHASE SWITCHED CAPACITOR CIRCUIT HAVING AN INDUCTIVE CHARACTERISTIC

Boris Sokoloff, Grenoble, France, assignor to Societe Pour L'Etude Et La Fabrication De Circuits Integres Speciaux - E.F.C.I.S., Grenoble, France

Filed Sep. 24, 1982, Ser. No. 422,390
Claims priority, application France, Oct. 2, 1981, 81 18636
Int. Cl.³ H03H *11/48*
U.S. Cl. 333—214 **3 Claims**



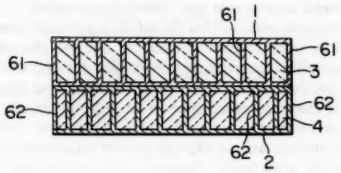
1. A circuit having an inductance characteristic, comprising a first terminal; a second terminal; an operational amplifier, having an input and an output; a first capacitor; a second capacitor; a first switch; a second switch; and a third switch; said switches being controlled by a switching control logic circuit according to a periodic cycle of not more than three non overlapping phases; said first, second and third switches being respectively closed during a first, second and third phase; said first switch being connected on one side to said first terminal, and on the other side being connected only to three components namely to a first side of said first capacitor and to one side second and third switches; said second switch being connected on the other side to said inut of operational amplifier; said third switch being connected on the other side to said output of said operational amplifier; said second capacitor being connected on one side to said input and on the other side only to said output and to the other side of said third switch; said first capacitor having a second side connected to said second terminal during said first phase and to ground during second and third phases.

4,513,266

MICROWAVE GROUND SHIELD STRUCTURE

Osamu Ishihara, Sanda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 19, 1982, Ser. No. 435,116
Claims priority, application Japan, Nov. 28, 1981, 56-193520
Int. Cl.³ H01P *3/08*
U.S. Cl. 333—238 **2 Claims**



1. In a microwave circuit of a three plate construction having a plurality of independent circuits formed in an inner level, said inner level being sandwiched between two dielectric boards with conductive layers on their outer surfaces to provide a pair of outer grounded layers, the improvement comprising:

a plurality of through holes formed in said dielectric boards between the physically neighboring circuits in said plurality of independent circuits in said inner level and extending from one of said outer conductive layers to the other, said through holes being formed in line and connected to a common electrically conductive layer at intermediate portions thereof, said through holes being formed at offset positions on the opposite sides of the common electrically conductive layer, and

a metallized coating on the inner surfaces of said through holes connecting said outer conductive grounded layers and providing a ground shield between said neighboring circuits.

4,513,267

STATIONARY CONTACT STRAP TO ACHIEVE A CURRENT LIMITING BLOW-OFF EFFECT

David P. McClellan, Westminster, and Frank W. Kussy, Randallstown, both of Md., assignors to Siemens-Allis, Inc., Atlanta, Ga.

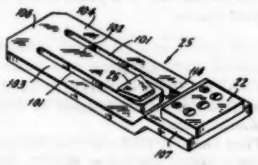
Filed Mar. 28, 1983, Ser. No. 479,367
Int. Cl.³ H01H *77/02*
U.S. Cl. 335—16 **12 Claims**

1. A circuit breaker including contact means adapted to be blown open by electrodynamic forces generated under severe fault current conditions, said contact means comprising a stationary section including a stationary contact, and a movable

section including a movable contact operable into and out of engagement with said stationary contact to respectively close and open said circuit breaker;

said stationary section also including an interior arm, first and second exterior arms disposed outboard of said interior arm along opposite sides thereof, each of said arms having a first end and a second end;

a connecting section electrically connecting said arms together at their said first ends and being co-planar with said interior arm and said exterior arms, a terminal section connecting said exterior arms together at their said second ends and adapted for fixed connection in an external circuit, said stationary contact being mounted to said interior



arm at its said second end and being disposed between said terminal section and said connecting section;

said movable section also including a movable arm having said movable contact mounted at one end thereof;

said movable arm extending from said one end toward said connecting section and having its other end adapted for fixed electrical connection in an external circuit;

with said contacts engaged said movable arm confronting said interior arm in closely spaced relationship and said exterior arms being disposed outboard of said movable arm whereby current flow in said interior arm is opposite to current flow in said movable and exterior arms resulting in a strong blowoff effect under severe fault current conditions.

4,513,268

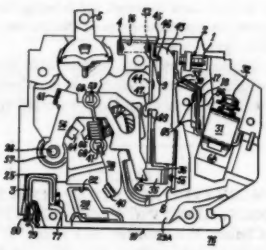
AUTOMATED Q-LINE CIRCUIT BREAKER

Raymond K. Seymour, Plainville; Joseph M. Palmieri, Southington; William J. Ashline, Bristol, and Dennis J. Doughty, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,259

Int. Cl.³ H01H *75/12*

U.S. Cl. 335—35 **14 Claims**



1. An electric circuit breaker for fully automated assembly comprising:

a molded plastic case having a plurality of retaining slots and guide channels formed therein;

a trip unit and terminal assembly consisting of a lug terminal and bi-metal at one end and a contact blade having top and bottom ends at an opposite end joined by means of a braided conductor;

a magnet assembly consisting of an armature and magnet core, said armature being formed from a single L-shaped metal piece having a narrow top piece and a wider angled bottom piece which includes a latch opening, said magnet core being formed from a single L-shaped metal piece having a top angled piece for providing a pivot to said core, a bottom angled piece and a hook extension for engaging said armature bottom piece which forms a closed magnetic loop in cooperation with said armature bottom piece;

a cradle formed from a U-shaped piece having a handle tab at a top for engaging a handle, a latch portion at an end of one leg of the U for releasably engaging said latch opening and a circular end member at an end of another leg of the U, said circular member pivotally supporting the cradle within said case; and

a mechanism spring connecting between said cradle and said contact blade to bias a moveable contact on said contact blade into contact with a fixed contact supported on said case when an operating handle is in a closed position for providing current flow through said contacts and for rapidly separating said contacts when said trip unit releases said cradle latch portion from said latch opening upon excess current flow through said contacts.

4,513,269

INTERLOCKING CONTACTOR ASSEMBLY

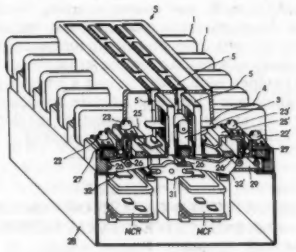
Motomu Miyamoto, 108 House Toritsudai, 12-21, 2-Chome, Nakane, Meguro-Ku, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 500,148

Claims priority, application United Kingdom, Jun. 3, 1982, 57-95632

Int. Cl.³ H01H *9/20*

U.S. Cl. 335—161 **13 Claims**



1. A connector assembly, comprising

(a) a case member provided with a plurality of pole chambers which are serially and vertically sectioned;

(b) a traveling contact member arranged in each of said pole chambers, said traveling contact member including a bar having an arm portion-extending in the left direction, an arm portion extending in the right direction, and at least one traveling contact terminal provided at the tip of each of said left and right arm portions;

(c) a support frame made of conducting material suspended in each of said pole chambers for pivotally fixing said traveling contact members on the top portion thereof;

(d) a pair of right and left operation frames liftably arranged in each of said pole chambers adjacent the right and left arm portions of said traveling contact member, respectively, each of said operation frames being formed with a window through which the adjacent arm portion of said traveling contact member extends and including a pair of upper and lower contact springs arranged in said window for sandwiching said arm portion therebetween and an integral vertical leg portion extending downwardly from

one side of its lower surface, said pair of right and left operation frames being interlockingly connected at the lower ends of said leg portions with electromagnetic means,

(e) return springs provided on the lower surface of said operation frames and extending downwardly to said electromagnetic means; and

(f) stationary contact terminals provided in the path of movement of said traveling contact terminals, at least two connecting terminals provided at one side of said pole chamber, and at least one connecting terminal provided at the other side.

4,513,270

CONTACTOR HAVING SELF-PROTECTION MEANS AGAINST THE EFFECT OF THE FORCES OF REPULSION BETWEEN THE CONTACTS

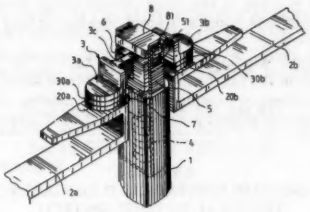
Elie Belbel, Epinay sur Seine; Christian Blanchard, Nanterre; Michel Lauraire, Courbevoie; Louis Fechant, Le Vesinet, and André Haury, Le Raincy, all of France, assignors to La Telemecanique Electrique, France

Filed Nov. 30, 1982, Ser. No. 445,774

Claims priority, application France, Nov. 30, 1981, 81 22975

Int. Cl.³ H01H *77/08*

U.S. Cl. 335—195 **5 Claims**



1. A contactor comprising:

a. first and second conductive substantially flat stationary contact carriers symetrically arranged about an axis of symmetry and extending substantially at right angles with said axis of symmetry and first and second stationary contacts mounted on the first and second conductive stationary contact carriers respectively;

b. a movable insulating contact holder mounted for translation along the said axis of symmetry;

c. a U-shaped magnetic member having first and second legs and a groove between said first and second legs, said groove having a bottom, said U-shaped magnetic member being rigidly connected to the contact holder and forming a permanently open magnetic circuit;

d. a magnetic armature resiliently coupled to the contact holder and a permanently open air gap located between the said armature and the said U-shaped magnetic member;

e. a bridging conductive movable contact carrier resiliently coupled to said contact holder and having a central blade which is substantially at right angles with the stationary contact carriers, said blade extending substantially at right angles to the said axis with first and second portions symmetrically arranged with respect to the said axis and first and second movable contacts rigidly coupled to the said first and second portions respectively, the said stationary contact carriers having means for generating electrodynamic blow off forces on the said movable contact carrier, said blade engaging the said groove, whereby the magnetic flux developed in the U-shaped member when overload current flows through the central blade crosses the said groove thereby generating electrodynamic forces forcing the movable contact carrier towards the bottom of the groove and the movable contacts against the stationary contacts; and

f. means for exerting on the contact holder a pulling force parallel to the said axis for carrying the said movable contacts into and out of engagement with the stationary contacts.

4,513,271

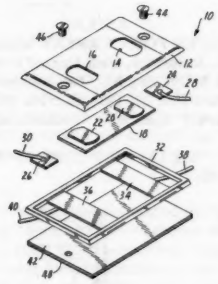
MOMENTARY CONTACT MAGNETIC SWITCH

Daniel E. Reisem, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 16, 1982, Ser. No. 399,261

Int. Cl.³ H01H *9/00*

U.S. Cl. 335—205 **21 Claims**



1. An electrical switch, comprising:

a magnetic cover plate having a plurality of apertures therein;

a flexible sheet magnet positioned in back of said cover plate at least partially covering said plurality of apertures, said flexible sheet magnet being positioned in a normal position magnetically attracted to said cover plate and being in part flexibly movable to an actuated position away from said cover plate at one of said plurality of apertures by manual actuation through said one of said plurality of apertures; and

contact means for each plurality of apertures positioned in cooperation with said flexible sheet magnet, said contact means for providing a change in electrical continuity when said flexible sheet magnet is moved between said normal position and said actuated position.

4,513,272

DEVICES FOR MANUFACTURING A MAGNETIC QUADRUPOLE POST-FOCUSING MASK

Jan Verweel, and Hinne Zijlstra, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 250,496, Apr. 2, 1981, Pat. No. 4,428,736.

This application May 16, 1983, Ser. No. 478,395

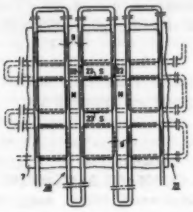
Claims priority, application Netherlands, Apr. 21, 1980, 8002303

Int. Cl.³ H01F *13/00*

U.S. Cl. 335—284 **7 Claims**

1. A device for manufacturing a magnetic quadrupole post-focusing mask for use in a color display tube, the mask including a plate of magnetizable material having at least two mutually spaced parallel rows of apertures provided through oppositely facing sides of the plate, the device comprising: a coil

including a pair of mutually parallel electrical conductors, the conductors being arranged such that, when the coil is provided



against one side of the plate, the two conductors extend along the material between the rows.

4,513,273

TRANSDUCER FOR CURRENT MEASUREMENT

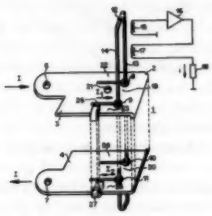
Richard Friedl, Brunswick, Fed. Rep. of Germany, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Feb. 23, 1984, Ser. No. 582,969

Claims priority, application Switzerland, Mar. 2, 1983, 1136/83

Int. Cl.³ H01F *27/08, 27/28*

U.S. Cl. 336—55 **11 Claims**



1. A transducer for measurement of a current, comprising in combination

a magnetic core, and

a single U-shaped flat conductor having two wings, and a crown joining said wings, each wing having two openings, said magnetic core passing through said openings,

said two wings constituting two conductive branches in thermal contact with one another, each branch being adapted to carry a component of said current, the current component carried by one branch differing from the current component carried by the other branch, said current components giving rise to opposite respective component fluxes in said magnetic core.

4,513,274

CURRENT TRANSFORMER FOR MEASURING INSTRUMENTS

Mathis Halder, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Apr. 14, 1983, Ser. No. 484,921

Claims priority, application Switzerland, Apr. 22, 1982, 2438/82

Int. Cl.³ H01F *40/00*

U.S. Cl. 336—173 **6 Claims**

1. A current transformer for use in electrical AC current measuring instruments,

comprising in combination,

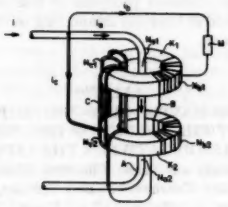
first, second and third current circuits, each circuit including a first winding, and a second winding in series with said first winding, and each winding having respective predetermined numbers of turns,

first and second cores,

said first windings forming with said first core a first current transformer stage,

said second windings forming with said second core a second current transformer stage,

at least said first and third current circuits being connected in parallel,



said first and second windings of said first circuit being wound on said first and second cores in a predetermined sense,

said first winding of said third current circuit being wound on one of said cores in a sense opposite to said predetermined sense,

said second winding of said third current circuit being wound on the other core in said opposite sense,

a samll difference existing between the number of turns of said first and second windings of said third current circuit.

4,513,275

PUSH-BUTTON CONTROLLED MINIATURIZED THERMAL CUTOUT/SWITCH

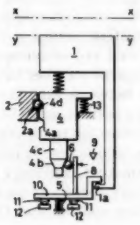
Gérard M. R. Jullien, Paris, France, assignor to L'Equipement et la Construction Electrique en abrege E.C.E., France

Filed May 2, 1983, Ser. No. 490,349

Claims priority, application European Pat. Off., Mar. 9, 1983, 83400481.4

Int. Cl.³ H01H *71/16*

U.S. Cl. 337—66 **5 Claims**



1. A miniaturized low-tension double contact switch with thermal overload protection, comprising:

a housing having two fixed contacts (**12**);

a push-button (**1**) movably mounted to said housing for movement in a first direction and for movement in a second opposite direction;

a movable contact support (**10**) movably mounted to said housing;

two movable contacts (**11**) connected to said support and aligned with said two fixed contacts for closing said two fixed contacts when said support is moved to engage said two movable contacts against said two fixed contacts;

actuation locking means (**2**,**2***a*,**4**,**4***a*,**4***d*) engageable by said push button for movement into a first position with move-

ment of said push button in its first direction, for effecting movement of said support to close said two fixed contacts, and movable into a second position when said push button is again moved in its first direction for moving said support to open said fixed contacts;

overload locking means (*4b*,6,8) engaged between said actuation locking means and said movable contact support having a normal load position for transmitting movement of said actuation locking means to said support to move said support to close said fixed contacts with movement of said actuation locking means, and an overload position for disengaging movement of said support from movement of said actuation locking means; and

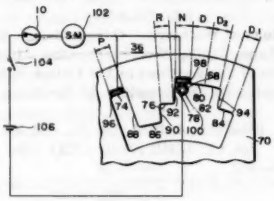
biasing means engaged between said housing and said movable contact support for moving said movable contact support into a position opening said fixed contact when said overload locking means is in its overload position.

4,513,276

SAFETY SYSTEM OF AUTOMOTIVE AUTOMATIC TRANSMISSION OPERATING DEVICE

Shikibu Kubota, and Shisaku Tsuji, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Feb. 1, 1982, Ser. No. 344,823
Claims priority, application Japan, Feb. 9, 1981, 56-17627
Int. Cl.³ B60Q *1/00*; F02N *17/00*
U.S. Cl. 340—52 R **7 Claims**



1. In a motor vehicle having a starter motor, an electric power source, an automatic transmission, a shift lever movable into select positions for placing the transmission in corresponding gear conditions, means defining stepped operation surfaces, and a stop pin carried on said shift lever to move therewith and slidably engageable with said stepped operation surfaces for retaining said shift lever at ones of said select positions,

a safety system comprising:

(a) a starter switch interposed between said starter motor and said electric power source, and

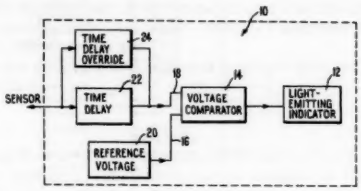
(b) a position detector switch connected in series with said starter switch for energizing said starter motor upon closure of said starter switch and said position detector switch, said position detector switch including at least one stationary contact member mounted to at least a part of one of said stepped operation surfaces, and a single movable contact member mounted to said stop pin at the portion engageable with said stepped operation surfaces whereby engagement of said stop pin with said at least one stationary contact member of said one stepped operation surface both retains said shift lever and closes an electrical circuit for energizing said starter motor.

4,513,277

LOW FUEL INDICATOR SYSTEM

John T. Moore, Nr. Wigan; Peter E. Corrigan, Liverpool, and James A. Gardner, Nr. Liverpool, all of England, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1983, Ser. No. 472,712
Claims priority, application United Kingdom, Mar. 9, 1982, 8206860
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—59 **4 Claims**



1. A low fuel indicator system for monitoring the operation of a fuel level sensor in a fuel tank in a motor vehicle having an ignition system, said indicator system having an input line supplied by the ignition system and comprising;

voltage comparator means having an output and first and second inputs,

a time delay circuit,

light-emitting indicator means connected to the output, the first input being connected to a reference voltage source and the second input being connected through the time delay circuit to said fuel level sensor to receive a voltage signal from said fuel sensor, said time delay circuit substantially isolating the comparator from the effects of rapid fluctuations in fuel level in said tank, said voltage comparator means being operable to compare the voltages on said two inputs to energize said light-emitting indicator means when said fuel sensor voltage signal corresponds to a predetermined low level of fuel in said tank,

the time delay circuit coupled to the input line and to the second comparator input and effective upon initial switching on of the ignition system to energize the indicator means for a variable time period dependent upon the relative fuel level so that higher fuel levels correspond to short indication periods and increasingly lower fuel levels result in increasingly longer indicator periods, whereby a fuel level indication is provided by the variable time period.

4,513,278

VIDEO SYNTHESIZER FOR A DIGITAL VIDEO DISPLAY SYSTEM EMPLOYING A PLURALITY OF GRAYSCALE LEVELS DISPLAYED IN DISCRETE STEPS OF LUMINANCE

Charles L. Seitz, San Luis Rey, Calif.; Paul Grunewald, Flemington, N.J.; Marshall M. Parker, San Diego, and Irvin G. Stafford, Carlsbad, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

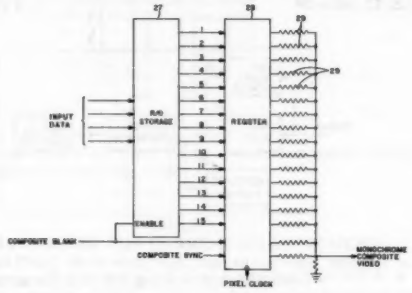
Continuation of Ser. No. 836,842, Sep. 26, 1977,. This application Oct. 9, 1979, Ser. No. 82,565
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **5 Claims**

1. A video synthesizer for a digital video display system, said video synthesizer comprising:

a summing network to provide in sequence a plurality of different output voltage levels which levels are selected from three or more such levels to designate different luminance values to be displayed, said summing network having a plurality of different input leads, said summing network including a plurality of resistances coupled between said respective input leads and a common connec-

tion, said resistances having different resistance values to provide to said common connection different voltage levels which increase proportionately to a root of the luminance to be displayed;

a storage device having a plurality of output leads coupled to respective ones of said summing network input leads, said storage device storing different monotonic operation codes to activate different combinations of said input leads



such that an increase or decrease in the output voltage level only results from a corresponding increase or decrease respectively in the number of said input leads to be activated, and

means coupled to said storage device to transmit a binary code to said storage device which binary code designates a monotonic operation code to select the particular luminance to be displayed.

4,513,279

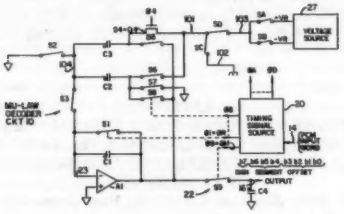
CHARGE REDISTRIBUTION MU-LAW PCM DECODER

Christopher W. Kapral, Belmont, Calif., assignor to GTE Communications Products Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 558,565, Dec. 5, 1983, Pat. No. 4,468,653, which is a continuation-in-part of Ser. No. 307,823, Oct. 2, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,411

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **15 Claims**



1. Apparatus for converting PCM code words into associated analog signal samples, each word including first, second and third code groups of one or more binary bits which define the polarity, prescribed segment, and step offset within the prescribed segment for an associated analog signal sample, said apparatus comprising:

first, second and third capacitor means each having one and other sides thereof and each having the same value of capacitance;

first means for impressing a prescribed reference voltage and ground on first and second bus lines, respectively;

operational amplifier means having input and output terminals thereof connected to said one and other sides of said first capacitor means, said input terminal essentially having ground impressed thereon; and

first switch means responsive to the second and third code groups (a) for cyclically connecting one and other sides of said second capacitor means to ground and to one of ground and said reference voltage, respectively, for discharging said second capacitor means and charging it with the reference voltage in accordance with the level of a bit in said third code group, and then connecting one and other sides of said second capacitor means to associated sides of said first capacitor means for redistributing charge thereon a number of times corresponding to the number of bits in said third code group defining the step offset in the prescribed segment; (b) for discharging said first capacitor means; (c) for storing charge on said second capacitor means while cyclically connecting one and other sides of said third capacitor means to ground and to said reference voltage for charging said third capacitor means, and then connecting opposite sides of said third capacitor means to associated sides of said first capacitor means for redistributing charge on them a first prescribed number of times (which may be zero) associated with the prescribed segment which is designated by the second code group; (d) for connecting one and other sides of said second capacitor means to said one side of said first capacitor means and ground, respectively, for transferring all charge on said second capacitor means to said first capacitor means for the prescribed segment; and (e) for cyclically connecting opposite sides of said third capacitor means to ground for discharging it and then connecting them to associated sides of said first capacitor means for redistributing charge on them a number of times corresponding to segments that are above the prescribed segment which is specified by the second code group.

4,513,280

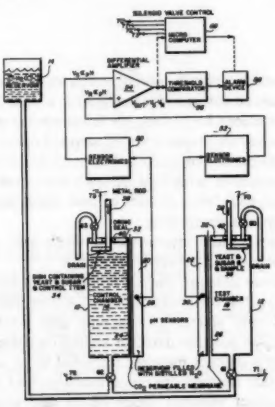
METHOD AND APPARATUS FOR THE DETECTION OF TOXICANTS

Patrick J. Hannan, Washington, D.C.; Arthur V. Stiffey, Slidell, La.; N. Lynn Jarvis, Woodbridge, and Henry Wohltjen, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1984, Ser. No. 656,208

Int. Cl.³ G08B *17/10*; **C12Q** *1/04*

U.S. Cl. 340—632 **13 Claims**



1. A biological sensor for the detection of toxicants in a sample comprising:

a first and second CO_2 sensing cells, each sensing cell including a first chamber for holding a liquid flush medium, a

second chamber containing said liquid flush medium, a CO_2 permeable membrane disposed to separate said first and second chambers, and a pH sensor disposed in said second chamber,

said first chamber of said first CO_2 sensing cell including means adaptable for agitation for holding microorganisms, a growth medium, and a control item, said first chamber of said second CO_2 sensing cell including means adaptable for agitation for holding microorganisms, a growth medium, and a sample to be tested for toxicants;

a flush reservoir for containing said liquid flush medium for connection to said first chambers of said first and second CO_2 sensing cells;

wherein the CO_2 produced by said microorganisms from the mixture of said microorganisms and said growth medium in said flush medium contained in said first chambers of said first and second CO_2 sensing cells is passed through said CO_2 permeable membrane into said second chambers of said first and second CO_2 sensing cells containing said pH sensors; and

means for determining the difference between the outputs from said pH sensors in said first and second CO_2 sensing cells and generating an alarm signal if said difference equals or exceeds a predetermined threshold.

10. A biological method for detecting toxicants in a sample via the use of a first and second CO_2 sensing cells, with each CO_2 sensing cell including a first chamber and a second chamber, separated by a CO_2 permeable membrane, and a pH sensor disposed in a liquid in each of said second chambers, the method comprising the steps of:

disposing microorganisms, a growth medium for said microorganisms, and a sample to be tested for toxicants in said first chamber of said first CO_2 sensing cell along with a flush medium, while disposing microorganisms, a growth medium for said microorganisms, and a control item said first chamber for said second CO_2 sensing cell along with a flush medium;

agitating the contents of said first chambers;

sensing the pH in the liquid contained in each of said second chambers;

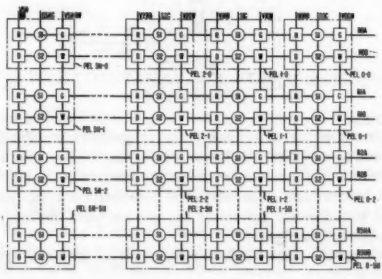
determining the difference between the outputs from said pH sensors; and

generating an alarm signal if said difference equals or exceeds a predetermined threshold.

4,513,281
AC PLASMA PANEL SHIFT WITH INTENSITY CONTROL

Peter D. T. Ngo, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 5, 1982, Ser. No. 365,460
Int. Cl.³ G09G 3/28
U.S. Cl. 340—703 **10 Claims**



1. A plasma panel having a plurality of discharge sites, each site having opposing dielectric surfaces and each site operable for ionizing the plasma gas at a particular panel location between said surfaces, said ionization including the periodic generation of an electron charge cloud,

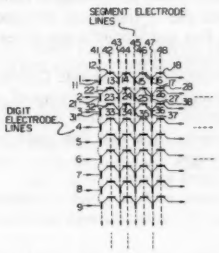
characterized in that said panel also includes at least two migration sites associated with each said discharge site, each said migration site located along the same surface as said associated discharge site and each said migration site including means for independently and selectively attracting electrons from said associated discharge site during said electron charge cloud generation interval, each said migration site further including means responsive to the direct impingement of said attracted electrons thereupon for emitting light rays under control of said selectively attracted electrons, and

means for removing said impinged electrons from said migration site.

4,513,282
LIQUID CRYSTAL MATRIX DISPLAY DEVICE

Tadahiko Nakagiri, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 219,634
Claims priority, application Japan, Dec. 28, 1979, 54-173029; Dec. 28, 1979, 54-173027
Int. Cl.³ G09G 3/36
U.S. Cl. 340—765 **5 Claims**



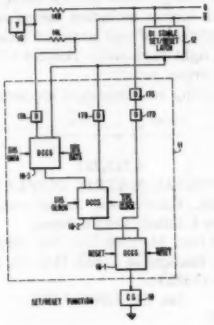
1. In a liquid crystal display device having a first transparent substrate with a first set of transparent segment electrodes formed thereon and a second transparent substrate with a second set of transparent digit electrodes formed thereon in positions corresponding to said first set of transparent electrodes, and a layer of liquid crystal enclosed between said first and second substrates, whereby a set of display segments is defined with each display segment being formed by one of said first set of transparent electrodes in conjunction with a corresponding one of said second set of transparent electrodes, the improvement whereby each of said display segments is of elongated shape and whereby said set of display segments comprises a matrix array of basic segment units, each of said basic segment units comprising at least a first display segment and a second display segment with the axes of elongation thereof orientated in mutually different directions, the improvement further comprising a plurality of digit electrode lines for applying drive signals to said display segments, each of said digit electrode lines being coupled to a row of said basic segment units in said matrix array, and a plurality of segment electrode lines each of which is coupled to a column of said display segments, each of said display segments being responsive to simultaneous application of drive signals to a corresponding digit electrode line and segment electrode line for being driven into excitation, with there being an even number of rows of said basic segment units with alternate ones of said digit electrode lines being positioned on opposite sides of a median axis of said matrix array of basic segment units, and with pairs of said digit electrode lines which are symmetrically disposed with respect to said median axis being connected in common.

4,513,283

LATCH CIRCUITS WITH DIFFERENTIAL CASCODE CURRENT SWITCH LOGIC

Joel C. Leininger, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,599
Int. Cl.³ H04Q *1/20*; H03K *19/00, 3/289*
U.S. Cl. 340—825.02 **21 Claims**



1. A set/reset latch circuit comprising in combination:
(a) a cross-coupled pair of transistors arranged as a bistable device having first and second stable states and first and second output terminals;
(b) a multi-level Differential Cascode Current Switch tree operable to develop set and reset control pulses for said circuit in response to logic input signals to switch said device respectively from said first state to said second state and vice versa;
(c) a constant current source;
(d) two load resistors, each of which is selectively connectable to said current source through said tree by said logic input signals;
(e) means connecting said first and second output terminals to said load resistors; and
(f) means for connecting said current source to said bistable device selectively through one of two different serial current paths of said tree to provide a current to one of said load resistors through one of said cross-coupled pair of transistors to hold said device in one of said stable states in the absence of said set and reset control pulses.

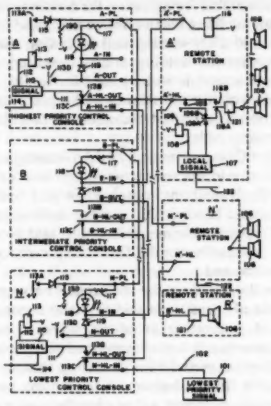
4,513,284

CONSOLE PRIORITY CONTROL

Robert W. Right, Huntington, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 24, 1983, Ser. No. 478,430
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.51 **9 Claims**

1. In a priority control circuit the combination comprising:
(a) a plurality of identical control console circuits identified in order of declining priority A, B, . . . N;
(b) each of said control circuits including a priority lead coupled in common and extending to at least one controlled remote station for exercising control thereover;
(c) each of said control console circuits including means for normally coupling a potential of a first polarity, through a current-limiting resistor, to said priority lead;
(d) first circuit means responsive to the activation of any one of said control console circuits for coupling a potential of a second polarity to said priority lead;
(e) each of said control console circuits including an "In" and and "Out" lead with a first diode coupled therebetween to pass current in only one direction between said "Out" lead and said "In" lead;
(f) indicator means coupled between said priority lead and the "In" lead at each of said control console circuits;
(g) second circuit means responsive to the activation of any one of said control console circuits for coupling a potential of said first polarity to the "out" lead of the activated control console circuit; and
(h) third circuit means coupling the "Out" lead of each control console circuit to the "In" lead of the next lower priority control console circuit.

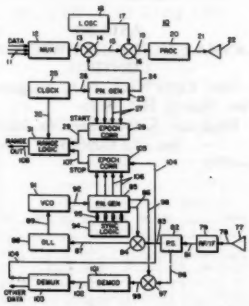


4,513,285

QUASI COHERENT TWO-WAY RANGING APPARATUS

Lawrence W. Pike, Salt Lake City; John W. Zschelle, Jr., Farmington, and Billie M. Spencer, Bountiful, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,688
Int. Cl.³ G01S *13/08*
U.S. Cl. 343—5 PN **6 Claims**



1. Apparatus for determining the range between the first station and a second station by measuring the time required for radio frequency signals to be transmitted between the stations without turn-around coherency, the combination comprising:
a first pseudonoise generator for generating a plurality of unique coded signals,
a stable master clock for driving said first pseudonoise generator,
first station start epoch detecting means coupled to said first pseudonoise generator for detecting a predetermined one of said unique coded signals and for generating an epoch marker start signal,

a ranging system at said first station coupled to said epoch marker start signal,

first station transmitting means coupled to said first pseudonoise generator,

second station receiving means adapted to receive the transmitted first station pseudonoise generated signals,

second station tracking means coupled to said second station receiving means for locking-on said first station pseudonoise generated signals and for generating second station synchronized clock signals,

said second station tracking means comprising a second pseudonoise generator driven by said second station synchronized clock signal and for locking-on said first station pseudonoise generated signals,

second station detecting means for detecting the presence of said predetermined one of said unique coded signals and for simultaneously generating a new epoch read signal,

a third pseudonoise generator driven by said synchronized clock signals without being synchronized with said second pseudonoise generator,

second station transmitting means coupled to said third pseudonoise generator,

first station receiving means adapted to receive the second station transmitted signals from said third pseudonoise generator,

first station tracking means coupled to said first station receiving means for locking-on said second station pseudonoise generated signals and for generating first station synchronized clock signals,

said first station tracking means comprising a fourth pseudonoise generator driven by said first station synchronized clock signals for locking-on said second station pseudonoise generated signals,

first station stop epoch detecting means coupled to said fourth pseudonoise generator and said ranging system for detecting a new epoch and for generating a stop signal,

new epoch storage means responsive to said new epoch read signal from said second station detecting means for reading and storing a new unique coded signal from said third pseudonoise generator into said new epoch storage means to provide a new epoch signal,

said new epoch storage means being coupled to said second station transmitting means for selectively transmitting said new epoch signal to said first station receiving means and said first station stop epoch detecting means,

said new epoch signal being transmitted from said second station to said stop epoch detecting means in said first station and being stored and compared with the output signals from said fourth pseudonoise generator until said output signals compare with said stored new epoch to produce a new epoch stop signal, and

said ranging system comprising ranging logic being started by said epoch marker start signal and being stopped by said new epoch stop signal, whereby

the time duration between said epoch start signal and said new epoch stop signals is indicative of the range between said stations.

4,513,286
ADAPTIVE CONSTANT FALSE ALARM RATE (CFAR) PROCESSOR

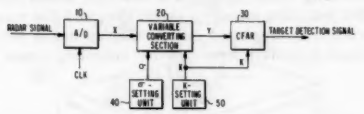
Takeru Irabu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,334
Claims priority, application Japan, Apr. 3, 1981, 56-50082
Int. Cl.³ G01S 7/34
U.S. Cl. 343—5 CF **9 Claims**

1. An adaptive Constant False Alarm Rate (CFAR) processor for detecting a target signal at a constant false alarm rate out of a radar input signal which includes a clutter whose amplitude X exhibits any type of known cumulative distribution function F(X) or probability density function f(X), said processor being of the type wherein said radar input signal is converted in conversion means to a signal Y and wherein said signal Y is then processed and the processed signal compared to a threshold level in CFAR processing means to obtain a target indication signal, the improvement comprising:

said conversion means including a σ setting unit and a K setting unit for producing signals which indicate a predetermined arbitrary scale parameter σ and shape parameter K, respectively:

said conversion means comprising variable conversion



means for converting said radar input signal into said signal Y defined by

$$Y=\sigma[-1n\{1-F(X)\}]^{1/K}$$

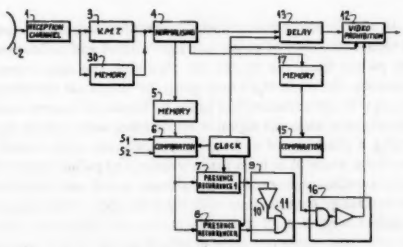
in response to output signals of said σ setting unit and K setting unit; and

said CFAR processing means varying said threshold level in accordance with the value of said shape parameter K provided from said K setting unit.

4,513,287
DEVICE FOR THE ELIMINATION OF Nth TRACE MOVING ECHOES AND INTERFERENCE ECHOES IN A RADAR

Serge J. Penhard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 25, 1982, Ser. No. 411,567
Claims priority, application France, Aug. 28, 1981, 81 16466
Int. Cl.³ G01S 7/28, 9/02
U.S. Cl. 343—5 CF **10 Claims**



6. In a pulse-burst radar system in whcih each pulse consists of a burst of recurrences 1 to n, and where the return recurrence echoes may be received for each of the radar's range cells, and wherein the radar system comprises an aerial, a reception channel connected to said aerial for receiving recurrence echoes 1 to n, a bulk memory connected to said reception channel for storing said recurrence echoes, moving target means connected to said bulk memory for visualizing said moving targets, said moving target means transparent to the first recurrence echo and processing recurrence echoes 2 to n, display means connected to said moving target means for displaying recurrence echoes, a device for eliminating nth trace moving echoes and radar interference echoes comprising:

normalizing means connected to said moving target means for normalizing the recurrence with respect to noise:

first comparing means connected to said normalizing means for comparing the strength of said first recurrence echo with a threshold S_1, and comparing the strength of said nth recurrence echo with a threshold S_2;

first determining means connected to said comparing means

for determining whether thresholds S_1 and S_2 have been exceeded by said first and n^{th} recurrence echoes, respectively;

first indicating means connected to said comparing means for generating a signal when both thresholds S_1 and S_2 have been exceeded;

delay means connected to said normalizing means for delaying recurrence echoes 1 to n; and

authorizing means connected to said delay means and to said first indicating means for authorizing said first recurrence echo to be displayed on said display means when said signal is received from said first indicating means.

4,513,288

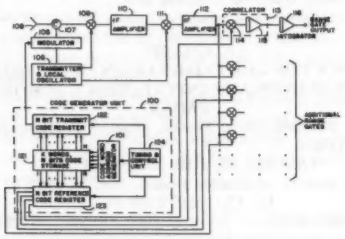
GROUP-COMPLEMENTARY CODE SETS FOR IMPLEMENTING PULSE-COMPRESSION PROCESSING WITH OPTIMUM APERIODIC AUTOCORRELATION AND OPTIMUM CROSS-CORRELATION PROPERTIES

Glenn D. Weathers, and Edward M. Holliday, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1982, Ser. No. 362,934

Int. Cl.[3] **G01S** *7/28*

U.S. Cl. 343—17.2 PC **3 Claims**



1. In a pulse compression radar system for detecting a target in which a plurality of pulses are transmitted and reflection of those pulses from the target are received, the improvement comprising the method of arranging the temporal distribution of energy in each transmitted pulse by biphased binary coding of the phase of a carrier signal in accordance with a code word; utilizing a plurality of at least three different code words in series for a series of at least three transmitted pulses; providing a corresponding reference series of code words and combining them in a range gate manner with the reflection of the transmitted pulses whereby all autocorrelation side lobes are identically zero; arranging the code words in group-complementary codes having sets of word groups comprising of at least eight rows by at least six binary elements; and providing pulse compression over at least three pulses.

4,513,289

P1 POLYPHASE CODE EXPANDER-COMPRESSOR

Frank F. Kretschmer, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1982, Ser. No. 377,106

Int. Cl.[3] **G01S** *13/28*

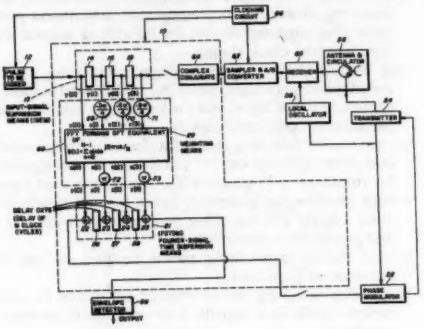
U.S. Cl. 343—17.2 PC **5 Claims**

1. A digital pulse-expander-compressor including

pulse coder means for providing a series of weighted pulses from a single input pulse, the time interval of the series being greater than that of the input pulse, the coder means including weighting means; and

pulse compression means of the matched-filter type for receiving and processing echo signals correspnding to the output signals of the coder means, the pulse compression means including weighting means which is the same weighting means as that employed in the coder means,

wherein the improvement comprises said weighting means including a discrete Fourier transform circuit; an ordered array of phase-shifters, the phase shift of each phase shifter



differing from that of the next by a common phase angle, the phase-shifters being connected in order, one per input, to consecutive inputs of the discrete Fourier transform circuit after the first input; and a plurality of inverters, a respective inverter being connected to every other output of the discrete Fourier transform circuit.

4,513,290

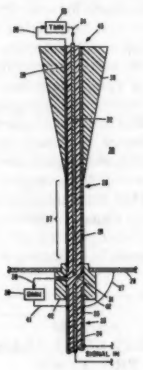
NON-RESONANT COAXIAL MONOPOLE ANTENNA

Donald K. Lefevre; Patrick W. Dennis, both of Salt Lake City, and Dennis F. Seegmiller, Kaysville, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,485

Int. Cl.[3] **H01Q** *9/02, 9/38*

U.S. Cl. 343—745 **17 Claims**



1. A non-resonant broad band monopole antenna comprising:

a ground plane,

a coaxial input line having a center conductor, and an outer shield which is connected to said ground plane below said ground plane,

a fractional wavelength coaxial monopole antenna extending from said ground plane having a center conductor, and an outer radiator which is connected to said center conductor of said coaxial input line,

said monopole antenna having an exposed ground plane portion and a tip portion,

tip matching means coupled between the center conductor and the outer radiator of said coaxial antenna at the tip portion end remote from said ground plane,

base matching means coupled between the center conductor of said coaxial antenna and said ground plane at the ground plane portion end of said coaxial antenna, and

absorbing means covering a portion of said outer radiator of said coaxial monopole antenna remote from said ground plane,

said absorbing means having a thickness which varies along the length of the antenna increasing in thickness toward said tip matching means,

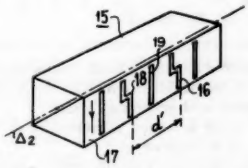
whereby said fractional wave length monopole antenna displays an equivalent infinite wavelength over a broad band of frequencies.

4,513,291

WAVEGUIDE HAVING RADIATING SLOTS AND A WIDE FREQUENCY BAND

Serge Drabowitch, Paris, France, assignor to Thomson-CSF, France

Filed Aug. 27, 1982, Ser. No. 412,210
Claims priority, application France, Sep. 11, 1981, 81 17236
Int. Cl.³ H01Q *13/10*
U.S. Cl. 343—771 **6 Claims**



1. A rectangular waveguide having pairs of narrow and wide sides and defining a longitudinal axis, said waveguide comprising direct-radiation slots, each slot being disposed on one of the narrow sides of the waveguide in parallel relation to each other and orthogonal to the longitudinal axis of the waveguide so as to be parallel to the lines of current flow along said one narrow side, each said slot having a lenght L in the vicinity of the operating wavelength λ of said waveguide and including a transverse stepped section formed in the central portion of the slot orthogonal to the current lines, and wherein a distance d is defined between the transverse stepped sections of successive slots so as to be in the vicinity of the wavelength λ of said waveguide.

4,513,292

DIPOLE RADIATING ELEMENT

David F. Bowman, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 428,586
Int. Cl.³ H01Q *9/28*
U.S. Cl. 343—795 **8 Claims**

1. A radiation structure for operation over a range of frequencies comprising:

a one piece radiating element in the form of a wide, thin electrical conductor, said conductor having first, second and third sections;

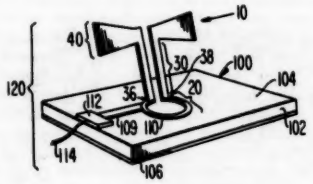
said first section adapted for connection to a feed circuit;

said second section connecting said first and third sections and spacing them apart;

said conductor having an elongated slot through its thin dimension direction which extends at least from within said first section to within said third section to separate said second section into first and second spaced apart balanced transmission line members;

said first section connecting said first transmission line member to said second transmission line member;

said first section having a length from said first transmission line member to said second transmission line member which is substantially an odd integer multiple of one-half wavelength at a frequency in said range of frequencies when said element is connected to said feed circuit;



said third section comprising a dipole electrically coupled to said first section by said balanced transmission line members of said second section; and

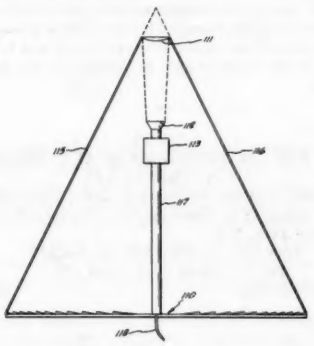
said element being free of ground conductors extending parallel to said second and third sections.

4,513,293

FREQUENCY SELECTIVE ANTENNA

Kenneth D. Stephens, St. Just, P.R., assignor to Communications Design Group, Inc., Nashville, Tenn.

Filed Nov. 12, 1981, Ser. No. 320,722
Int. Cl.³ H01Q *15/16*
U.S. Cl. 343—840 **13 Claims**



1. A high frequency reflective antenna which is preferentially frequency selective at a design frequency of a given frequency or narrow range of frequencies, comprising

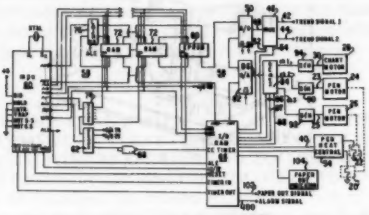
a plurality of adjacent antenna sections comprising a central section and substantially concentric sections disposed radially outward from the central section, each section having a parabolic surface of different focal length, and each concentric section being offset with respect to the next preceding section by a distance M in a direction substantially parallel to the central axis of the antenna, where M is greater than one-half wavelength but not a precise multiple of one-half wavelength or of one wavelength of the design frequency of the antenna and M progressively increases for each succeeding concentric section.

4,513,294

PHYSIOLOGICAL TREND DATA RECORDER

Donald G. Anderson, Meriden, Conn., and Elisa M. Ferrara-Jordan, Longmeadow, Mass., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,019
Int. Cl.³ G01D *9/00*; A61B *5/04*
U.S. Cl. 346—33 ME **2 Claims**



1. A strip chart recorder responsive to the occurrence of an alarm condition for recording first and second trend signals representative of a physiological condition on a strip chart comprising:

recording means operable for recording the first trend signals on the strip chart at a faster than real time rate in response to a first rate signal and for recording the second trend signals on the strip chart at a real time rate in response to a second rate signal;

storing means for storing said first trend signals representative of said physiological condition in the past; and

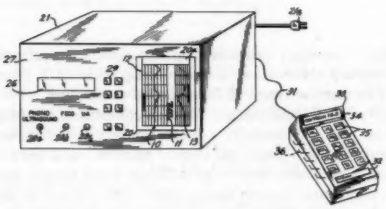
controlling means operable for controlling the storing means so as to provide the stored first trend signals to the recording means in response to the occurrence of the alarm condition and for providing the first rate signal, the second rate signal and the second trend signals to the recorder; said second trend signals representative of the physiological condition at points in time subsequent to those represented by the first rate signal and being provided to the recorder after recordation of the first trend signals.

4,513,295

METHOD FOR RECORDING MEDICAL INFORMATION ON A STRIP CHART

Flave L. Jones, Guilford, and Mark L. Kelly, Middletown, both of Conn., assignors to American Home Products Corporation (Del.), New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,325
Int. Cl.³ G01D *9/00*; A61B *5/04*
U.S. Cl. 346—33 ME **14 Claims**



1. For printing by a strip chart recorder and displaying by a display device medical information, a method comprising:

communicating said medical information to switching membrane means;

scanning said switching membrane means;

generating one of a plurality of membrane signals in response to each communication and scan;

identifying said one of said plurality of membrane signals;

displaying by said display device said medical information in response to said identification; and

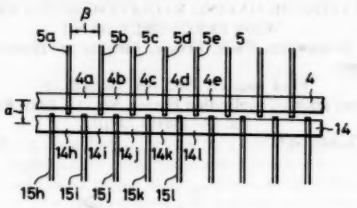
printing by said recorder said medical information in response to said identification.

4,513,296

HEAT-SENSITIVE RECORDING HEAD

Leng Svay; Haruhiko Moriguchi, and Toshiharu Inui, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Feb. 7, 1983, Ser. No. 464,173
Claims priority, application Japan, Feb. 6, 1982, 57-16975
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**



1. A heat-sensitive recording head, comprising:

two heat generating resistors which are obtained by dividing a conventional heat generating resistor;

the resistors being arranged substantially in parallel with each other on a substrate; and

first and second groups of lead electrodes which are coupled to the two heat generating resistors, respectively, in such a manner that the first and second groups of lead electrodes are shifted by half a pitch from each other;

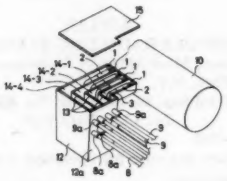
wherein the distance between the center lines of the two heat generating resistors is about half of the distance between two adjacent lead electrodes.

4,513,297

INK JET PRINTER RESERVOIR

Shigeru Okamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,207
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **4 Claims**



1. An ink jet printer, comprising:

(a) a platen for holding thereon a recording sheet;

(b) an ink container which moves along the axial direction of said platen, said ink container having:

(1) a container main body, a plurality of partition walls of substantially L-shaped cross-section dividing the interior of said container main body into a plurality of ink storing chambers; and

(2) an ink feeding tube connected with each of said ink storing chambers in said container main body and ar-

ranged in a direction parallel to said axis of said platen; and

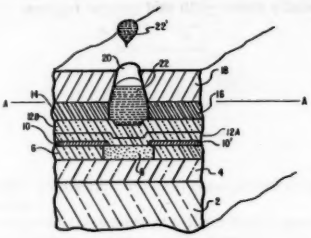
(c) a plurality of ink jet nozzles to eject ink stored in said ink storing chambers, said nozzles being provided in correspondence to said ink storing chambers.

4,513,298

THERMAL INK JET PRINTHEAD

Friedrich Scheu, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 25, 1983, Ser. No. 497,774
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **3 Claims**



1. In a thermal ink jet printhead assembly comprising a print head support member, an orifice plate having an orifice therein, means for supporting said orifice plate on said support member, and heating means formed of phosphorus diffused silicon disposed between said orifice plate and said support member and adjacent said orifice, the improvement comprising: a layer of a nitride of silicon disposed at least on said heating means, and a layer of silicon carbide disposed on said layer of said nitride of silicon.

4,513,299

SPOT SIZE MODULATION USING MULTIPLE PULSE RESONANCE DROP EJECTION

Francis C. Lee, San Jose, Calif.; Ross N. Mills, Boulder, Colo.; Robert N. Payne, San Jose, and Frank E. Talke, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,302
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **5 Claims**

1. A drop-on-demand ink jet printing system comprising an ink jet head having an ink cavity, an orifice communicating with said ink cavity, and an electromechanical transducer mounted in mechanical communication with said ink cavity, a source of electrical drive signals repeatable at a predetermined drop-on-demand drop production rate, and means to selectively actuate said electromechanical transducer in response to said electrical drive signals to force a single drop of ink from said orifice; the improvement comprising;

means for selectively producing at least one additional electrical drive signal each with a fixed time delay with respect to the immediately preceding electrical drive signal, said fixed time delay being short with respect to said drop-on-demand drop production rate; and

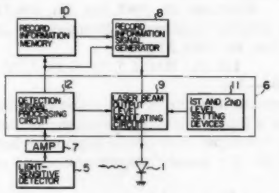
means to actuate said electromechanical transducer with each of said electrical drive signals to produce a quantity of ink having a predetermined volume from said orifice, said quantities of ink merging into a single drop of ink prior to the time the drop reaches the print medium for printing whereby each ink drop can be produced having a selected one of a plurality of possible drop sizes.

4,513,300

APPARATUS FOR DRIVING A SEMICONDUCTOR LASER FOR USE IN A LASER-BEAM PRINTER

Kimio Tatsuno, Kokubunji; Susumu Saito, Hachioji; Shoichi Ito, Ibaraki; Isamu Terashima, Hitachi; Yoshifumi Homma; Mitsugu Asano, both of Ibaraki, and Yoshifumi Ono, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jun. 14, 1983, Ser. No. 504,380
Claims priority, application Japan, Jun. 18, 1982, 57-103761
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 **3 Claims**



1. An apparatus for driving a semiconductor laser for use in a laser-beam printer including a light-sensitive drum, a deflector for deflecting a laser beam from the semiconductor laser, a light-sensitive detector placed in the vicinity of one of the edges of the drum for generating a scanning start signal, deflection of the laser beam by the deflector being such that the drum and the detector are scanned by the deflected beam, and means for producing a record-information signal, the apparatus comprising:

first means responsive to the output of said record information signal generating means for modulating the intensity of a laser beam from said semiconductor laser for generation of a modulated laser beam;

second means for generating first and second intensity modulation control signals in synchronism with said scanning, said first modulation control signal being in a pulse-waveform having a period identical with one scanning period in the direction lateral of said drum and a duration time beginning in synchronism with said scanning start signal and continuing at least for a time period necessary for said laser beam to laterally scan the substantial part of said drum, and said second modulation control signal being in a pulse-waveform obtained by inverting the waveform of said first modulation control signal, said drum and said detector being scanned during the said time period and the remaining time period in said one scanning period, respectively; and

third means for determining first and second levels for the

intensity of said laser beam during the drum scanning time period and the remaining time period in said one scanning period, respectively, said first means being further responsive to one of said first and second modulation control signals to establish a D.C. operating level for said laser, said D.C. operating level being alternately representative of said first and second levels depending upon the level of said one modulation control signal of the pulse waveform.

4,513,301

HEAT-SENSITIVE RECORDING MATERIAL

Yukio Takayama, Hyogo; Akio Noguchi, Osaka, and Takao Matsushita, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Company Limited, Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,817

Claims priority, application Japan, Dec. 11, 1982, 57-217587

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—200 **6 Claims**

1. In a heat-sensitive recording material in which a resin layer is formed on a recording layer containing at least a color forming material and a color developing material which forms a color when reacted with the color forming material by contact, the improvement comprising said resin layer is essentially composed of an acetoacetylated polyvinyl alcohol, a copolymer comprising vinyl alcohol and acrylonitrile or a mixture of said acetoacetylated polyvinyl alcohol and said copolymer.

4,513,302

PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING MATERIAL

Rosalinde Braun, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,712

Claims priority, application Switzerland, Jun. 24, 1982, 3886/82; Jan. 20, 1983, 318/83

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—210 **21 Claims**

1. A pressure-sensitive or heat-sensitive recording material comprising a support having a developer or both a color former and a developer in or on the support, wherein the developer consists of a metal complex compound of the formula wherein

Me is an n-valent metal ion,

R is a unidentate or polydentate colorless organic ligand which is complexd with the metal ion through heteroatoms,

An is a r-valent anion,

k is the coordination number 4 or 6 of the metal ion, depending on the metal,

n is 1, 2, 3 or 4, and

r is 1 or 2.

4,513,303

SELF-ALIGNED METAL FIELD EFFECT TRANSISTOR INTEGRATED CIRCUIT

Shakir A. Abbas, Wappingers Falls, and Ingrid E. Magdo, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 167,253, Jul. 8, 1980, Pat. No. 4,359,816. This application Aug. 6, 1982, Ser. No. 405,811

Int. Cl.³ H01L *29/94, 29/76*

U.S. Cl. 357—23.3 **5 Claims**

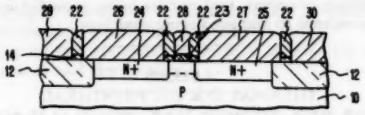
1. A field effect transistor self-aligned dynamic RAM integrated circuit structure comprising:

a silicon body having said field effect transistor dynamic RAM devices therein with regions of said devices extending to the major surface of said body;

silicon dioxide regions within said body for isolating groupings of said devices from one another;

at least some of said groupings of said devices including a PN junction drain and capacitor structure;

a pattern of narrow dimensioned dielectric regions on said surface of said body; and



electrical contacts to said drain and capacitor filling the spaces between said narrow dimensioned regions and which contacts are self-aligned to said narrow regions and substantially planar with said narrow regions.

4,513,304

SEMICONDUCTOR MEMORY DEVICE AND PROCESS FOR PRODUCING THE SAME

Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

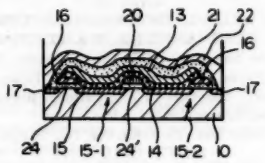
PCT No. PCT/JP80/00106, § 371 Date Jan. 12, 1981, § 102(e) Date Jan. 12, 1981, PCT Pub. No. WO80/02624, PCT Pub. Date Nov. 27, 1980

PCT Filed May 17, 1980, Ser. No. 229,596

Claims priority, application Japan, May 18, 1979, 54-61227

Int. Cl.³ H01L *29/78, 27/02*

U.S. Cl. 357—23.6 **24 Claims**



1. An improved semiconductor memory device of the type wherein a plurality of memory cells are fabricated on a semiconductor substrate having a first conductivity type, each memory cell including an MOS transistor having a gate electrode insulated from the substrate by a first insulating film and an MOS capacitor, wherein the improvement comprises:

each MOS capacitor comprises (a) a second insulating film of silicon nitride, (b) a capacitor electrode on one side of the second film, said second film additionally extending between the gate and capacitor electrodes to insulate one from the other, and (c) an electric charge storing region in the substrate on the other side of the second film, the charge-storing region including impurities introduced into the substrate so that the charge-storing region has a second conductivity type that is opposite that of the first conductivity type; and

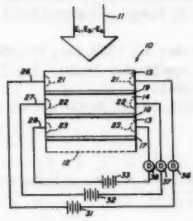
a combination of thick insulating films and field shield layers isolating the memory cells from each other, which films and layers extend in directions perpendicularly crossing with each other, each field shield layer being insulated from the substrate by a film having substantially the same composition and thickness as said first insulating film.

4,513,305

MULTI-WAVELENGTH DEMULTIPLEXER FOR FIBER OPTICAL COMMUNICATION

Walter L. Bloss, III, Sudbury, and Edward M. Brody, Wayland, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 6, 1982, Ser. No. 446,902
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **10 Claims**



1. A multi-wavelength optical demultiplexer comprising
a substrate;
a first relatively thick layer of a direct band gap semiconductor material deposited on said substrate;
a first relatively thin layer of latticed matched material having a larger band gap than the materials in the first thick layer, deposited on said first relatively thick layer, for serving as a potential barrier to prevent photo-electrons generated in one layer from entering another;
a second relatively thick layer of direct band gap semiconductor material deposited on said first relatively thin layer;
a second relatively thin layer of latticed matched material having a larger band gap than the materials on said substrate, deposited on said second relatively thick layer, for serving as a potential barrier to prevent photo-electrons generated in adjacent thick layer from entering another;
a third relatively thick layer of direct band gap semiconductor material deposited on said second relatively thin layer; and
ohmic contacts of donor impurity diffusion at opposite ends of each of said relatively thick layers,
wherein each of said relatively thick layers is on the order of one to ten microns thick to achieve good absorption, and
wherein each of said relatively thin layers is on the order of 100 Angstroms thick, large enough to serve as electron barriers, but thin enough to pass optical frequencies without significant loss.

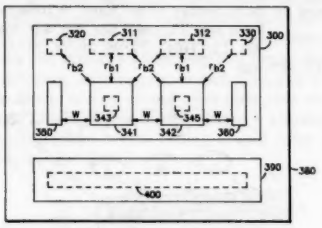
4,513,306

CURRENT RATIOING DEVICE STRUCTURE

Robert B. Davies, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,438
Int. Cl.³ H01L *29/72*
U.S. Cl. 357—36 **16 Claims**

1. A current ratioing device structure being located on a surface of a body of semiconductor and comprising:
a region of a first conductivity type having at least three contact portions;
at least one medial region of a second conductivity type, each medial region being of a uniform area, being surrounded by said region of said first conductivity type, being separated from a nearest contact portion of said first conductivity type region by a first distance, being separated from each of two next nearest contact portions of said first conductivity type region by a second distance and having a contact portion;
two contactless lateral regions of said second conductivity type, each being separated from a nearest contact portions of said first conductivity type region by said first distance, being separated from a next nearest contact portion of said first type by said second distance, and being lateral to and in line with said at least one medial region, each lateral



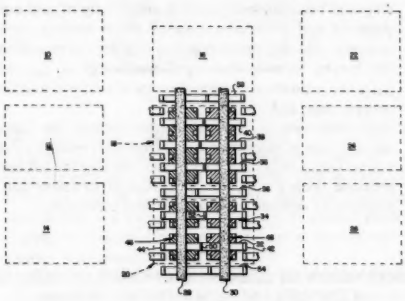
region being on an opposite side of said at least one medial region; and
a region of said second conductivity type surrounding said region of a first conductivity type.

4,513,307

CMOS/SOS TRANSISTOR GATE ARRAY APPARATUS

James L. Brown, Toddville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 5, 1982, Ser. No. 375,059
Int. Cl.³ H01L *27/12, 27/10, 29/78*
U.S. Cl. 357—42 **10 Claims**

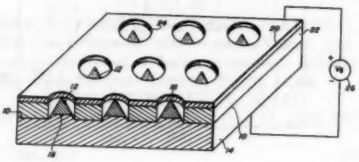


1. An integrated circuit transistor gate array comprising, in combination:
a substrate;
an array of groups of transistor gates, each transistor gate comprising a source, a drain and a control lead, fabricated on the substrate wherein each group comprises three contiguous transistor gates of a first polarity type connected in a drain-source series arrangement, two isolated transistor gates of said first polarity type, three contiguous transistor gates of a second polarity type connected in a drain-source series arrangement, and two isolated transistor gates of said second polarity type;
first means, attached to said substrate, connecting the control lead of each transistor gate of said first polarity to a control lead of a corresponding transistor gate of the second polarity in the group; and
insulation means covering a portion of said first means between said control leads whereby further leads can be attached to said substrate to interconnect noncontiguous transistor gates separated by said first means.

4,513,308
P-N JUNCTION CONTROLLED FIELD EMITTER ARRAY CATHODE

Richard F. Greene, Bethesda, Md., and Henry F. Gray, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1982, Ser. No. 421,766
Int. Cl.³ H01L *29/06, 29/34, 27/12*
U.S. Cl. 357—55 **16 Claims**

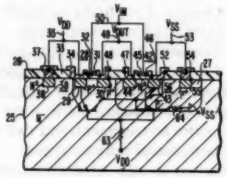


1. A field emitter array (FEA) comprising:
a semiconductor substrate,
an emitter surface formed on said substrate;
a plurality of field emitter sites, with each field emitter site including an emitter pyramid, with a tip, sides, and a base for emitting electrons in the presence of an electric field, wherein the base of said emitter pyramid is disposed upon said emitter surface, said emitter site also including a permanent reverse-biased p-n junction, where said junction is the boundary between a p-type layer and an n-type layer of semiconductor material, wherein said p-n junction is positioned relative to said emitter pyramid so that an electron current flowing from said substrate into said emitter pyramid must traverse said p-n junction and wherein said p-n junction is oriented so that the n-layer is disposed between said junction and the tip of said emitter pyramid and is isolated from all other emitter pyramid n-layers, said p-n junction acting to limit the magnitude of the current density flowing therethrough to j_{sat}, where j_{sat} is the saturation current density of said p-n junction in reverse bias; and
a grid, positioned above said emitter surface, for inducing the emission of electron current from said emitter pyramid where said grid is positively biased relative to said emitter pyramid with a bias voltage sufficient to cause said p-n junction to operate in reverse-biased saturation.

4,513,309
PREVENTION OF LATCH-UP IN CMOS INTEGRATED CIRCUITS USING SCHOTTKY DIODES

James R. Cricchi, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1982, Ser. No. 438,835
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—42 **18 Claims**

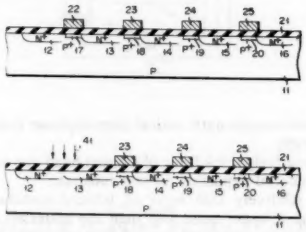


1. A field effect transistor with means to attenuate the injection of minority carriers into the body at times the source is forward-biased with respect to the body comprising,
a field effect transistor having a gate, drain, source and body, said drain and source formed by impurity regions of a first type in said body of a second type material,
a first Schottky barrier diode formed in said body having its anode coupled to said source.

4,513,310
SEMICONDUCTOR DEVICE CAPABLE OF STRUCTURAL SELECTION

Junichi Ohno, Yokohama, and Satoshi Konishi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 10, 1983, Ser. No. 493,226
Claims priority, application Japan, May 12, 1982, 57-79415; May 12, 1982, 57-79416
Int. Cl.³ H01L *29/40, 29/04, 29/42;* **B23K** *9/24*
U.S. Cl. 357—68 **9 Claims**



1. A semiconductor device capable of structural selection in response to the output of a radiating means, said device comprising:
a semiconductor substrate of a first conductivity type;
first wiring means having at least three first semiconductor regions of a second conductivity type which are formed at predetermined intervals in a surface of said semiconductor substrate, and at least two second semiconductor regions of the first conductivity type which are formed one each between pairs of adjacent ones of said first semiconductor regions, said first wiring means being electrically disconnected in an initial state;
an insulation film located over at least a portion of said first wiring means; and
a plurality of second wiring means which are formed on said insulation film over said first wiring means in correspondence with said second semiconductor regions, respectively, with each of said second wiring means extending across said first wiring means and being electrically connected in the initial state, and with each of said second wiring means and a corresponding one of said second semiconductor regions being formed at positions such that said each of said second wiring means and said corresponding one of said second semiconductor regions may be subject to the output of said radiating means so as to electrically disconnect said each of said second wiring means while at the same time electrically connecting together said first semiconductor regions arranged one at each side of said corresponding one of said second semiconductor regions.

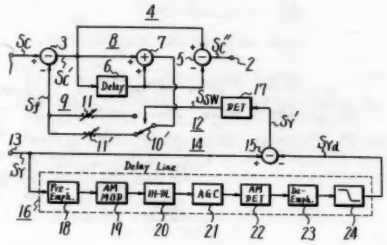
4,513,311
VIDEO SIGNAL PROCESSING UNIT

Jun Hirai, Tokyo, and Masayasu Kaneko, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,531
Claims priority, application Japan, Mar. 30, 1981, 56-46749
Int. Cl.³ H04N *9/491*
U.S. Cl. 358—40 **22 Claims**

1. A color video signal processing circuit for processing a composite color video signal containing a luminance compo-

nent and a chrominance component, the composite color video signal being formatted as a sequence of horizontal line intervals, each having a predetermined horizontal line period and each containing video information to be presented in vertical alignment with corresponding video information in an adjacent line interval, comprising chrominance comb filter means to which an intermediate chrominance signal is applied for providing a filtered chrominance component in which undesired signal components have been suppressed; an operational circuit providing a difference signal representing vertical correlation of the chrominance component in vertically aligned



portions of different horizontal line intervals; feedback loop circuit means for feeding back said difference signal and combining said chrominance component therewith to produce said intermediate chrominance signal, said feedback loop circuit means having variable non-zero feedback loop gains; detecting means for detecting correlation of video information in said luminance component in vertical aligned portions of different line intervals and providing a detecting signal in response to such detecting; and controlling means for adjusting said feedback loop gain to a respective non-zero value in accordance with said detecting signal.

4,513,312

SOLID-STATE COLOR TELEVISION CAMERA

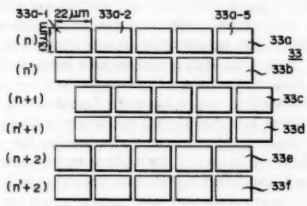
Yasuo Takemura, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1982, Ser. No. 429,011

Claims priority, application Japan, Sep. 30, 1981, 56-153564; Aug. 13, 1982, 57-139755

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **10 Claims**



1. A solid-state color television camera comprising:

an image pickup device;

a color filter array placed in front of said solid-state image pickup device;

a color separation circuit for extracting three primary colors, red, green and blue, from a multiplex signal derived from said image pickup device;

said filter array including a plurality of color filter rows arranged extending in the horizontal scanning direction, each of said color filter rows having color filter blocks with different color transmission characteristics alternately arranged, in which a first color filter row selected from said plurality of color filter rows is made up of first and second color filter blocks with first and second color transmission characteristics, said first color filter row is disposed adjacent to a second color filter row made up of and alternately arranged third and fourth filter blocks respectively having a third color transmission characteristic and a given transmission characteristic, and said first and second color filter blocks of said first color filter row are disposed and shifted a given length in the horizontal scanning direction, with respect to said third and fourth color filter blocks of said second color filter row; and

said solid-state image pickup device having a plurality of photosensors disposed corresponding to said color filter blocks of said color filter array.

4,513,313

SOLID STATE IMAGING DEVICE

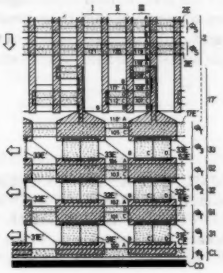
Takao Kinoshita, Tokyo, and Shinji Sakai, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 474,048

Claims priority, application Japan, Dec. 7, 1982, 57-214411; Dec. 10, 1982, 57-216391

Int. Cl.³ H04N *9/07, 3/14;* H01L *29/78;* G11C *19/28*

U.S. Cl. 358—44 **66 Claims**



13. A charge transfer device comprising:

(A) a storage portion including a plurality of storage cells each for storing an electrical charge, said storage cells being arrayed in at least one row, said one row being classified into a plurality of storage cell groups each including m adjacent storage cells, where m is an integer no smaller than three;

(B) (m−1) delay channels provided for each of said storage cell groups in said row of said storage portion, said delay channels being arranged to connect (m−1) storage cells to a remaining storage cell in each storage cell group and each having a different amount of delay; and

(C) a read-out portion for reading out the electrical charges of one row of said storage portion, said read-out portion being arranged to receive said electrical charges through said remaining storage cell in each storage cell group in said row of said storage portion.

4,513,314

INK USAGE ESTIMATOR

Karl M. St. John, Huntington Station; Nicholas J. Reeber, Hauppauge, and Sheldon J. Kerbel, Merrick, all of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,637

Int. Cl.³ H04N *1/46*

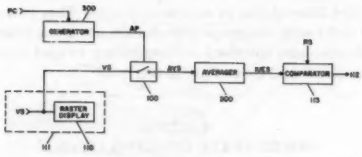
U.S. Cl. 358—76 **10 Claims**

1. An apparatus for providing an ink usage estimator signal representing the amount of ink required to print on a receptive media such as paper a portion of an image which is on film, said apparatus for use with a previewer which simulates the image

by providing to a raster display a video signal corresponding to the image, said apparatus comprising:

first means for selecting the portion of the image to be estimated and for providing area pulses during the periods of said video signal which represent the selected portion of the image;

second means for gating the video signal with the area pulses to provide an area-defined video signal corresponding to



the video signal periods which define the selected portion of the image;

third means including an RC circuit having a time constant, said third means for averaging the area-defined video signal to provide an output signal corresponding to an average of the area-defined video signal; and

fourth means for varying said time constant in accordance with the area of the selected portion of the image whereby said output signal is said ink usage estimator signal.

4,513,315

COMMUNITY ANTENNA TELEVISION ARRANGEMENT FOR THE RECEPTION AND DISTRIBUTION OF TV - AND DIGITAL AUDIO SIGNALS

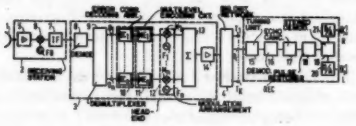
Cornelis B. Dekker, and Lodewijk B. Vries, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,907

Claims priority, application Netherlands, Jun. 25, 1981, 8103064

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—86 **6 Claims**



1. A community antenna television arrangement for the reception and distribution of TV signals and digital audio signals, particularly those signals which are transmitted by satellite, comprising a head-end, connected to a receiving antenna and a signal distribution network, a time-division multiplex signal which incorporates said digital audio signals in a time-division multiplex distribution being applied to said head end, which time-division multiplex signal is modulated on a sound carrier, characterized in that the head-end comprises a demodulation arrangement for demodulating the time-division multiplex signal to the baseband, a demultiplexing arrangement for demultiplexing the time-division multiplex signal, this demultiplexing arrangement having parallel outputs at which the digital audio signals are available in parallel, which outputs are connected to modulators of a modulation arrangement for modulating the digital audio signals on separate audio carriers, the modulation arrangement being connected to the signal distribution network for applying the digital audio signals to a plurality of subscribers' connecting points.

4,513,316

AUTOMATIC SURFACE INSPECTION SYSTEM

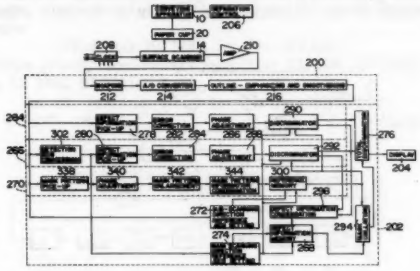
Yuji Kobayashi, Fujisawa, and Takao Okada, Kawasaki, both of Japan, assignors to Dai Nippon Printing Co., Ltd. and Ikegami Tsushinki Co., Ltd., both of Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,573

Claims priority, application Japan, Jul. 31, 1981, 56-120164

Int. Cl.³ H04M *7/18*

U.S. Cl. 358—106 **16 Claims**



1. An automatic surface inspection system comprising:

a surface scanning means for scanning the surface of an object to be inspected in main and sub-scanning directions, to output an analog picture element signal in each scanning direction;

a processing means having a pre-processing section adapted to receive said analog picture element signal from said surface scanning means for shaping said signal and converting it into a digital picture element signal, and a data processing section receiving said digital picture element signal from said pre-processing section for conducting surface inspection;

said data processing section including:

a first reference axis setting circuit adapted to receive said digital picture element signal from said pre-processing section for detecting a reference axis in the main scanning direction;

a second reference axis setting circuit receiving said digital picture element signal from said pre-processing section for detecting a reference axis in the sub-scanning direction;

a mask pattern circuit adapted to receive said digital picture element signal from said pre-processing section and the first and second reference axis information to produce mask pattern information on portions thereof which are not to be subjected to the surface inspection and storing the information in a reference memory;

a first detecting circuit having a first discriminating circuit receiving said digital picture element signal and said first and second reference axis information for conducting a surface inspection in the main scanning direction to produce a first defect signal while receiving said mask pattern information from said mask pattern circuit to make necessary masking treatment in the main scanning direction;

a second detecting circuit having a second discriminating circuit adapted to receive said digital picture element signal and said first and second reference axis information for conducting a surface inspection in the sub-scanning direction to produce a second defect signal while receiving said mask pattern information from said mask pattern circuit to make necessary masking treatment in the sub-scanning direction;

a defect information memory for storing said first and second defect signals until the second reference axis is detected;

a mask collation circuit for reading said first and second defect signals and masking the signals in accordance with

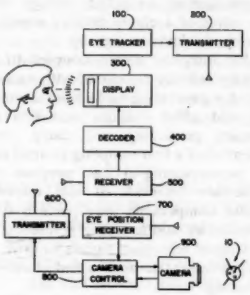
the mask pattern information from the reference memory; and

a total discriminating circuit adapted to receive the signals from said first and second discriminating circuits and an output from said collation circuit for deciding whether or not the surface of said object inspected is acceptable or defective.

4,513,317
RETINALLY STABILIZED DIFFERENTIAL RESOLUTION TELEVISION DISPLAY

Carl F. Ruoff, Jr., La Crescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1982, Ser. No. 425,204
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—133 **12 Claims**



1. A differential resolution television apparatus for displaying images of a remote site comprising:

a raster-scanned CRT display means having a viewing screen for displaying said images, said display means adapted for selectable raster scan operation at a first resolution level and at a second resolution level;

eye tracking means for sensing the line of sight of an observer's eye relative to the viewing screen and generating first position signals indicative of the position of the observer's line of sight relative to the viewing screen;

video camera means adapted for selectable raster scan sampling at said first resolution level and at said second resolution level such that a first region of the image is sampled at said first resolution level and the remainder of said image is sampled at said second resolution level;

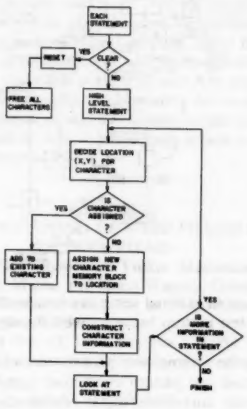
camera control means for controlling the resolution level of said camera means and the location of said first region in dependence upon said position signals from said eye tracking means;

means for transmitting video data generated by said camera means to said CRT display means, said CRT display means being further adapted to display said image at said first resolution level within said first region and at said second resolution level for the remainder of said image; and wherein said first resolution level is obtained by selecting a fine CRT beam and using the same raster line scan interval to scan a line in said first region as to scan a line at said second resolution level.

4,513,318
PROGRAMMABLE VIDEO TEST PATTERN GENERATOR FOR DISPLAY SYSTEMS

Barry F. Wilensky, and Joseph A. Maggi, both of Brooklyn, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 30, 1982, Ser. No. 429,927
Int. Cl.³ H04N *7/02, 9/62*
U.S. Cl. 358—139 **12 Claims**



1. A programmable video test pattern generator for display systems characterized by:

(a) issuing a high level statement of a pattern;

(b) determining a coordinate location for a character on the display;

(c) determining if the coordinate location has been assigned a character;

(d) constructing a new pattern segment by adding new information obtained from the high level statement to information previously in the assigned character if the coordinate location has been assigned a character;

(e) obtaining a blank character from a memory and constructing a new pattern segment by adding information obtained from the high level statement to the blank character if the coordinate location has not been assigned a character;

(f) determining whether more information is available from the high level statement; and

(g) returning to step b and repeating steps b through g if more information is available from said high level statement.

4,513,319
METHOD FOR AUTOMATICALLY SETTING UP A TELEVISION CAMERA

Hendrik Breimer, Breda, Netherlands; Frederik J. Van Roessel, Upper Saddle River, N.J., and Engbert Tienkamp, Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,657
Claims priority, application Netherlands, Dec. 30, 1981, 8105897
Int. Cl.³ H04N *9/04*
U.S. Cl. 358—163 **5 Claims**

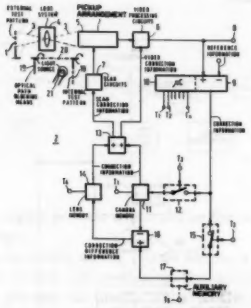
1. A method of producing lens system correction information for automatically setting up a television camera, said television camera having a lens system and a pickup arrangement on an optical path, said method comprising the steps of:

viewing an internal test pattern with the television camera to produce an internal test pattern correction signal, said

internal test pattern being viewed by blocking light from entering the lens system and by placing the internal test pattern in the optical path between the lens system and the pickup arrangement;

storing the internal test pattern correction signal in a camera memory;

viewing an external test pattern with the television camera



to produce an external test pattern correction signal, said external test pattern being viewed through the lens system;

subtracting the internal test pattern correction signal from the external test pattern correction signal to produce a lens system correction signal representing lens system correction information; and

storing the lens system correction signal in a lens memory.

4,513,320

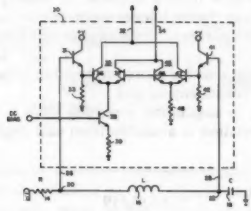
NON-LINEAR PEAKING SYSTEM

Daniel L. Reneau, Elmhurst; George J. Tzakis, Glenview, and Christopher M. Engel, Arlington Heights, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 7, 1983, Ser. No. 472,785

Int. Cl.³ H04N *5/14*

U.S. Cl. 358—166 **8 Claims**



1. A television luminance signal peaking circuit of the type wherein a peaking signal comprising the second derivative of the low pass luminance signal in conjunction with the low frequency portion of the luminance signal is used for signal enhancement and wherein amplifier means are provided for deriving signals representing the low pass luminance signal and opposite polarities of the second derivative of the low pass luminance signal, the improvement comprising:

first and second differential amplifiers in said amplifier means connected such that the common mode gain of said amplifier means is substantially unaffected by the differential mode signal level and the differential mode gain of said amplifier means is substantially unaffected by the common mode signal level.

4,513,321

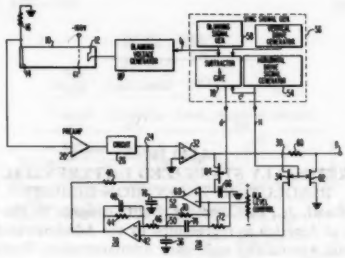
BLACK LEVEL CLAMP FOR TELEVISION SIGNALS

Charles L. Olson, Oaklyn, and John F. Monahan, Marlton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,834

Int. Cl.³ H04N *5/18*

U.S. Cl. 358—172 **19 Claims**



1. An improved clamp arrangement for television signals derived from a source of television signals, comprising:

controllable offset voltage generating means coupled between said source of television signals and an output terminal for establishing an offset voltage therebetween under the control of a clamp control signal, to thereby generate clamped television signals;

first controllable sampling means coupled to said output terminal and operatively associated with a source of reference voltage for generating said clamp control signal for establishing said offset voltage, said first controllable sampling means generating said clamp control signal under the control of a first sampling control signal during an interval encompassing at least portions of recurrent horizontal retrace intervals of said television signal, whereby noise components may perturb the reference voltage provided by said source of reference voltage and cause said clamped television signals to drift;

wherein the improvement comprises said source of reference voltage including:

controllable reference voltage generating means coupled to said source of television signals for deriving said reference voltage from said television signals under the control of a second sampling control signal; and

second sampling control signal generating means coupled to said controllable reference voltage generating means for generating second sampling control signals at times within the vertical blanking interval of said television signals, but only at times other than the times of said horizontal retrace intervals, whereby said reference voltage is not perturbed by noise and said clamped television signal does not drift.

4,513,322

SWITCHING NETWORK WITH SUPPRESSED SWITCHING TRANSIENTS

Paul Filliman, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1982, Ser. No. 437,828

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—181 **19 Claims**

1. A signal sampling system operative during a reference interval and a subsequent sampling interval, comprising:

a source of input signals containing information to be sampled;

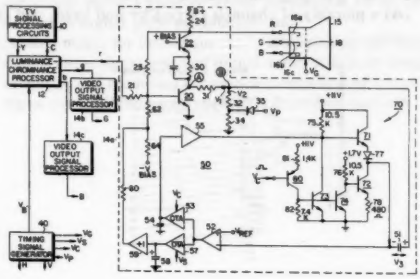
sampling means operative during said sampling interval and responsive to said input signals for providing an output signal representative of said information;

a source of switching signals; and

referencing means, including a capacitance, coupled to said

input signal source and said sampling means and operative during said reference interval to develop a reference bias on said capacitance for establishing a sampling reference bias condition for said sampling means, wherein said referencing means comprises:

first current conducting means responsive to said switching signals and coupled to said capacitance for providing currents for charging said capacitance;



second current conducting means responsive to said switching signals and coupled to said capacitance for providing currents for discharging said capacitance; and

means for rendering said first and second current conducting means non-conductive substantially simultaneously at the end of said reference interval, to suppress switching transients associated with the operation of said first and second current conducting means in response to said switching signals at the end of said reference interval.

4,513,323

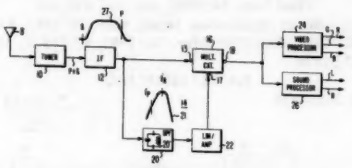
BUZZ REDUCTION FOR INTERCARRIER TYPE TELEVISION SOUND DETECTION

Chandrakant B. Patel, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,485

Int. Cl.³ H04N *5/62, 5/60*

U.S. Cl. 358—197 **7 Claims**



1. In a television receiver including means for providing an intermediate frequency (IF) signal including an IF sound carrier frequency modulated (FM) with multichannel audio information and an IF picture carrier amplitude modulated (AM) with video information and including a double sideband (DSB) portion, said means for providing said IF signal having a filter response characteristic with a sloped attenuation portion of a given polarity which causes unequal attenuation to upper and lower sidebands of said DSB portion whereby said unequally attenuated sidebands impart an undesired phase modulation to said IF picture carrier, an intercarrier multichannel sound signal detector comprising:

a multiplier having a first input coupled to receive at least said FM modulated IF sound carrier and a second input coupled to receive a switching control signal for multiplying said signals applied to said first and second inputs and providing at an output an intercarrier multichannel sound signal;

stereo sound processing means responsive to said multichannel intercarrier sound signal for producing left and right stereo sound signals; and

a switching control signal generating circuit coupled between said means for providing said video IF signal and said multiplier second input and responsive to said AM modulated IF picture carrier for generating said switching control signal;

said switching control signal generating circuit including filter means for presenting a sloped attenuation response characteristic to said AM modulated IF picture carrier of a polarity opposite said given polarity of said filter response characteristic of said means for providing said IF signal so that said switching control signal has substantially equal amplitude upper and lower sidebands corresponding to said DSB portion of said AM modulated IF picture carrier thereby compensating for said undesired phase modulation of said IF picture carrier and a corresponding buzz in said stereo signals which could otherwise be produced.

4,513,324

TELEVISION SCANNING OF WIDE FRAME MOTION PICTURE FILMS

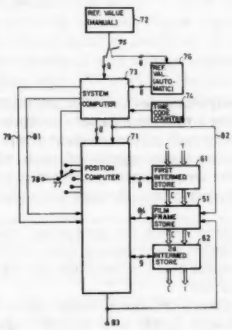
Dieter Poetsch, Ober-Ramstadt; Volker Massmann, Mühltal; Werner Becker, Mainz, and Horst Wagner, Griesheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 434,054

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142865

Int. Cl.³ H04N *3/36*

U.S. Cl. 358—214 **8 Claims**



1. Method of television scanning in television format of wide-field format motion picture films, in which digitalized television signals are produced line by line by means of an array of sensors on which the entire width of the film frames are projected with compression of the frames in width, comprising the steps of:

expanding every motion picture frame horizontally by a first factor by writing said signals for each frame successively into a first intermediate store and reading correspondingly selected portions of each line of said frame out of said store at a slower picture point rate than the writing-in rate without change of line rate;

writing said portions of lines of each frame, read out from said first intermediate store, into a film frame store;

reading a set of lines of said frame store constituting a first of two television interlaced fields out of said film frame store and then performing the same step for the set of the remaining lines of said frame store constituting the second of said two interlaced fields out of said frame store each said set of lines thereby constituting a half-picture field of the same frame;

expanding each said half-picture field horizontally by a second factor after storage of signals in said film frame store by selecting corresponding portions of all lines of each said field and reading said selected line portions of each said field out into an external circuit, and

during repeated performance of the foregoing steps, varying from time to time the line portions selected in one or both of the steps in which portions of lines are selected, at intervals not shorter than the frame transfer interval for the first expansion step and at intervals not shorter than the field transfer interval in the case of the second expansion step, for horizontal shift of the picture portion to be reproduced after subsequent readout into said external circuit.

4,513,325

IMAGE OUTPUTTING DEVICE

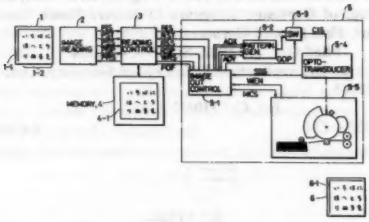
Satoru Itoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,124

Claims priority, application Japan, Mar. 13, 1981, 56-35402

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **8 Claims**



1. An image outputting device for outputting an image of an original containing a reference pattern comprising:

means for reading each picture element of an original and for obtaining serial image signals of areas of said original other than the area containing said reference pattern, said reading being performed through main scanning and subscanning;

pattern generation means for generating reference pattern signals at a timing in accordance with prearranged picture element positions on a scanning line corresponding to said reference pattern;

means for producing combined image signals by combining said serial image signals with said reference pattern signals; and

means for reproducing said combined image signals on a recording medium as a visible image including a reproduced reference pattern to thereby reproduce said original including said reference pattern on said recording medium and to enable subsequent reproduction from said recording medium.

4,513,326

MAGNETIC PRINTING MACHINE EMPLOYING A MULTI-CHANNEL RECORDING HEAD WITH MINIMAL CROSS-TALK WITH SECONDARY SCANNING HEAD MOVEMENT

Norio Kokaji, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 141,162, Apr. 17, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,799

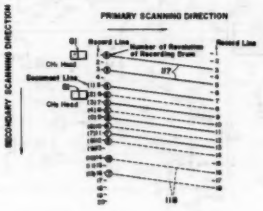
Claims priority, application Japan, Apr. 20, 1979, 54-48844

Int. Cl.³ H04N *1/24*

U.S. Cl. 358—301 **11 Claims**

1. A magnetic printing machine including a rotatable magnetic recording drum and a magnetic recording head arranged to be moved along the axial direction of said magnetic recording drum and fed with video signals to be processed, in which a first relative movement between said magnetic recording drum and said magnetic recording head in the peripheral direction of said magnetic recording drum is effected as a primary scanning, and a second movement between said magnetic recording drum and said magnetic recording head along the axial direction of said magnetic recording drum is effected as a secondary scanning; said machine comprising:

(A) a plurality of channels carried by said head, said channels being separated by a distance equal to a predetermined record line pitch multiplied by an integer $P(P \geqq 3)$, said record line pitch being defined as the distance traveled by one channel of said head in said secondary scanning direction during each revolution of said drum; and



(B) means for effecting said secondary scanning such that said magnetic recording head is moved along the axial direction of said magnetic recording drum a distance defined by the product of said predetermined record line pitch multiplied by the number of said channels of said magnetic recording head for each revolution of said drum.

4,513,327

DIGITAL SIGNAL RECORDING SYSTEM AND REPRODUCING APPARATUS

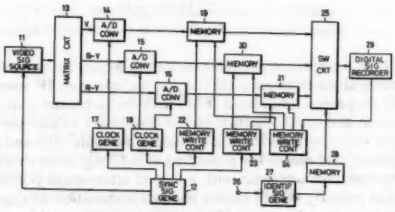
Nobuaki Takahashi, Yamato; Seiichi Takashima, Ayase; Takeshi Shibamoto, Sagamihara; Fujio Suzuki, Machida, and Koji Tanaka, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 24, 1983, Ser. No. 478,455

Claims priority, application Japan, Mar. 30, 1982, 57-51925; Mar. 30, 1982, 57-51926; Mar. 30, 1982, 57-51927; Mar. 30, 1982, 57-51928

Int. Cl.³ H04N *5/92*

U.S. Cl. 358—310 **11 Claims**



1. A digital signal recording system comprising:

first producing means for independently subjecting a luminance signal and two kinds of color difference signals of a color picture information to be recorded to digital pulse modulation, to produce a first digital luminance signal and first two kinds of digital color difference signals;

second producing means for alternately transmitting said first digital luminance signal and said first two kinds of digital color difference signals in terms of information of

one or a plurality of scanning lines, and producing a first digital video signal having a signal format wherein signal components of two sampling points of said first digital luminance signal are arranged within the same word and signal components of the same sampling point on a picture of said first two kinds of digital color difference signals are arranged within the same word;

third producing means for producing digital audio signals by subjecting audio signals of audio information to be recorded to digital pulse modulation; and

recording means for time-sequentially multiplexing said first digital video signal and said digital audio signals in terms of words, and recording the time-sequentially multiplexed signal onto the same one track on a recording medium.

4,513,328

METHOD OF RECORDING VIDEO SIGNALS WITHIN A PREDETERMINED BIT/UNIT TIME RECORDING RATE

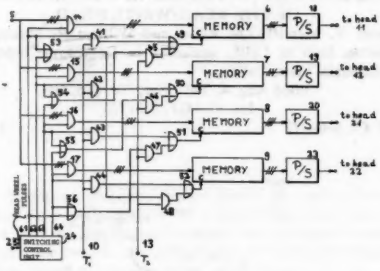
Jürgen Heitmann, Alsbach-Hähnlein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 352,009

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107733

Int. Cl.³ G11B *5/00, 15/02*

U.S. Cl. 360—8 **16 Claims**



1. Method of transducing digital video signals to a magnetic tape (1), in which the digital signals are received at an input (5) at a predetermined bit rate, which may exceed the bit/unit time recording rate for recording of signals on the tape,

in which the tape (1) is passed in a helical path about the transducer scanning drum having a rotating head wheel (4) with at least three transducer heads (11, 12, 21, 22), spaced equally apart, which transduce signals on inclined tracks on the tape,

comprising the steps of

receiving the digital signal at its predetermined bit rate;

storing the digital signals at said predetermined bit rate;

reading-out the stored digital signals at said bit rate times the ratio of the angular spacing of the transducer heads to 180° to transform the video signals into time-expanded signals;

switching the signals being read-out to respective transducer heads then in contact with the tape;

and recording the signals being read-out on the tape.

4,513,329

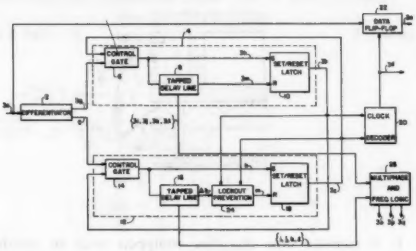
MANCHESTER DECODER CLOCK MULTIPLIER

Aldan D. Gomez, El Cajon, and Edward W. Gennetten, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1983, Ser. No. 528,386

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—42 **12 Claims**



1. A Manchester decoder clock multiplier which comprises:

means, disposed to receive an incoming conventionally encoded Manchester signal, for differentiating between positive voltage transitions and negative voltage transitions in the Manchester encoded signal, said differentiating means emitting separate trigger signals wherein the first trigger signal contains assertions of a predetermined pulse width associated with voltage transitions that correspond to data logic "0"'s within the conventionally encoded Manchester signal, and the second trigger signal contains assertions of a predetermined pulse width associated with voltage transitions corresponding to data logic "1"'s contained within the conventionally encoded Manchester signal;

first means, connected to receive the first trigger signal output from the differentiating means, for detecting and passing a signal waveform containing only those assertions in the first trigger signal that are associated with logic "0"'s within the Manchester signal, said first detecting means also selectively delaying and providing for output of a plurality of delayed waveforms from the passed signal waveform;

second means, connected to receive the second trigger signal output from the differentiating means, for detecting and passing a signal waveform containing only those assertions in the second trigger signal that are associated with logic "1"'s within the Manchester signal, said second detecting means also selectively delaying and providing for output of a plurality of delayed waveforms from the passed signal waveform;

means, connected to the first and second detecting means, for establishing a decoded clock signal by combining a select output signal from each of the first and second detecting means;

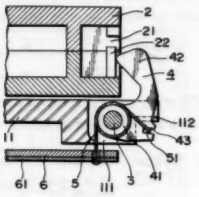
means, disposed to receive the incoming conventionally encoded Manchester signal and connected to the output of the establishing means, for decoding the Manchester signal to reveal the data which was encoded in the Manchester signal; and

means, connected to receive the plurality of delayed signals from both the first and second detecting means, for constructing a plurality of predetermined clock waveforms which differ in phase and frequency.

4,513,330
ACCIDENTAL ERASING PREVENTATIVE DEVICE FOR A CASSETTE TAPE RECORDER

Toshihiro Nakao, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,292
Claims priority, application Japan, Feb. 24, 1981, 56-25088[U]; Feb. 24, 1981, 56-25089[U]
Int. Cl.³ G11B *15/04*
U.S. Cl. 360—60 **3 Claims**



1. A cassette tape recorder equipped with an accidental erasure preventive device comprising:

means defining a cassette compartment having a bottom side arranged to receive therein a tape cassette having in one lateral surface thereof at least one removable accidental erasure preventing lockout tab;

erasure-recording means for simultaneously erasing information recorded on tape contained within a tape cassette inserted into said cassette compartment and for recording other information thereon;

erasure-recording contact circuit means for controlling operation of said erasure-recording means, said control circuit means including switch means for preventing erasure and recording of information from and on said tape;

lever means disposed in a position to engage a lockout tab of a cassette inserted in said cassette compartment, said lever means being arranged to rotate for engagement with said lockout tab, said lever means being adapted to occupy a first position when a cassette inserted in said cassette compartment has a lockout tab thereon and a second position when a cassette inserted in said cassette compartment does not have a lockout tab thereon; and

spring means rotatively biasing said lever means in a direction toward engagement with a lockout tab of a cassette inserted in said cassette compartment and for simultaneously cooperating with said switch means to render said erasure-recording means inoperative to erase and record information when said lever means is in one of said first and said second positions and to enable erasure and recording by said erasure-recording means when said lever means is in the other of said first and second positions; and

wherein

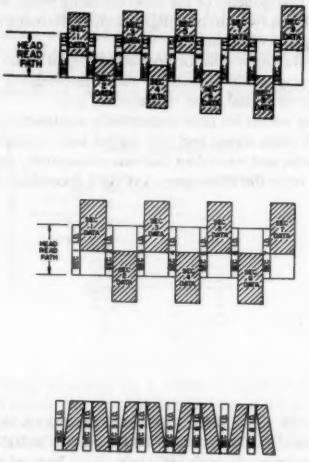
said spring means comprise an electrically conductive member having one end thereof electrically connected with said erasure-recording control circuit means and the other end thereof adapted to be brought into and out of conductive engagement with said switch means in response to the position of said lever means.

4,513,331
METHOD AND APPARATUS FOR DISK DRIVE ALIGNMENT

Bradley D. Baker, San Jose, and Richard L. Kelly, Santa Clara, both of Calif., assignors to Dysan Corporation, Santa Clara, Calif.

Filed Oct. 12, 1982, Ser. No. 433,950
Int. Cl.³ G11B *5/46*
U.S. Cl. 360—75 **10 Claims**

1. An improved digital diagnostic diskette for use in testing alignment and performance of a disk drive having a linear position mechanism for a transducer, said diskette comprising a magnetic recording disk having a first plurality of progressive offset concentric data tracks distributed there across at

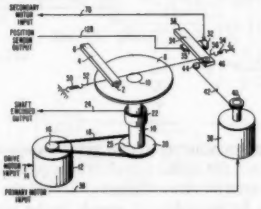


different predetermined radial positions, each progressive offset track having an offset range exceeding the track width for which said transducer is designed.

4,513,332
DISK DRIVE HAVING FINE AND COARSE CONTROL OF THE READ/WRITE HEAD

Lauren V. Merritt, Los Altos, and William R. Maclay, Los Gatos, both of Calif., assignors to Datacopy Corporation, Mountain View, Calif.

Filed Aug. 4, 1982, Ser. No. 405,206
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—77 **1 Claim**



1. A disk drive for recording and reproducing information in a magnetically-recorded data track on the surface of a disk placed on a disk spinner, comprising:

a transducer for recording and reproducing data signals with respect to said disk;

first-moving means, energizable for moving said transducer in coarse movement generally along a radius of said surface of said disk, between the rim of said disk and the operational center of said disk;

second-moving means, energizable for moving said transducer in fine movements generally along said radius of said surface of said disk;

third-moving means for spinning said disk spinner;

control means, coupled to said first-moving means and to

said second-moving means so that said transducer is selectively moved, through energization of said first-moving means, from track to track over the surface of said disk, and is caused to precisely follow a track selected by energization of said first moving means, through energization of said second-moving means;

said first-moving means including a cable wound around a drum, one end of said cable being connected to said transducer, such that as said first-moving means is energized and disenergized, said cable is wound onto said drum or unwound from said drum, to thereby move said transducer in coarse movements generally along said radius of said surface of said disk, and,

said second-moving means including means for exerting a force on said cable such that as said second-moving means is energized and disenergized, the effective cable length is changed to thereby move said transducer in fine movements generally along said radius of said surface of said disk.

4,513,333

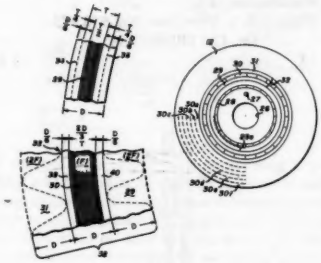
DIAGNOSTIC RECORDING

Ronald E. Young, Los Gatos, and Duane C. Meulners, San Jose, both of Calif., assignors to Dymek Corporation, San Jose, Calif.

Continuation of Ser. No. 351,934, Feb. 24, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,829

Int. Cl.³ G11B *5/00, 5/46, 5/58, 23/34*

U.S. Cl. 360—77 **28 Claims**



1. A diagnostic magnetic record media for loading into a computer drive and readable by a computer system for enabling a user of the system to diagnose the signal-to-noise quality and the head location alignment of the system relative to predetermined acceptable limits, comprising:

a first data track having a magnetic test data signal recorded thereon of a predetermined amplitude and in a format readable by a computer system and of a frequency F, wherein F is a predetermined basic data recording frequency, the first data track being of width T wherein T is the width of written data recorded by a recording head;

a pair of spaces located on opposite sides of and in abutment with each edge of the first data track, each of said spaces being of a width of approximately D/6 wherein D is the distance between center lines of adjacent data tracks, whereby the spaces have a width of a value to allow for design tolerance within the computer system and resulting in acceptable off-track operation range;

a pair of interference tracks with each interference track located in abutment with one of the spaces, each of the interference tracks being recorded with a continuous wave magnetic interference signal recorded thereon of a frequency different from the frequency F whereby a noise wall is established on each side of the first data track; and

a narrowed data track of a width less than T and having recorded thereon a magnetic signal having an amplitude less than the amplitude of data recorded on the first data track whereby the signal-to-noise level of the computer system may be diagnosed relative to a predetermined reference level.

4,513,334

HEAD POSITIONING APPARATUS

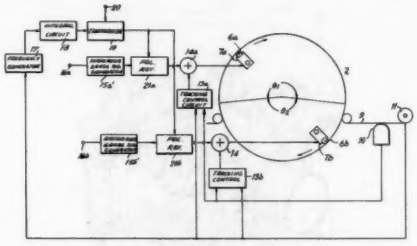
Toru Otsuka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,068

Claims priority, application Japan, Apr. 2, 1982, 57-54934

Int. Cl.³ G11B *5/52*

U.S. Cl. 360—75 **7 Claims**



1. A head positioning apparatus for a helical-scan tape reproducing device having a rotary transducer for reproducing signals from tracks on a record medium, electrically deflectable mounting means mounting the rotary transducer and positioning signal generating means for applying a positioning electrical signal to the mounting means for deflection thereof, the head positioning apparatus comprising:

hysteresis-erase signal means for applying a hysteresis-erasing electrical signal to the mounting means for deflection thereof to remove residual deflection resulting from deflection by said positioning signal means; and

polarity selecting means for selecting the polarity of said hysteresis-erasing signal depending on the direction of deflection of said mounting means by said positioning signal.

4,513,335

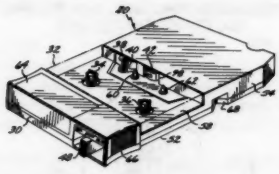
8-TRACK CASSETTE ADAPTOR

Rudolf van Kreuningen, Torrance, Calif., assignor to Kraco Enterprises, Compton, Calif.

Filed Jun. 24, 1982, Ser. No. 391,924

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—94 **14 Claims**



1. For use in a cassette adaptor, a tape transport mechanism, operable from the driven capstan of an 8-track tape player, for transporting tape from a rewind reel to a takeup reel and for later rewinding the tape, the mechanism comprising:

a main drive wheel, said wheel contacting the capstan of the 8-track tape player; and

linkage means selectively operable to alternatively

engage said main drive wheel with tape playing means for transporting the tape past a pickup head;

engage said main drive wheel with rewind drive means for rewinding the tape; and

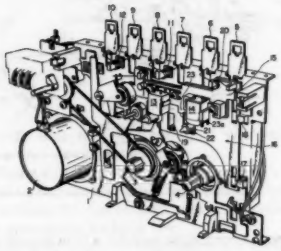
disengage said main drive wheel from both the tape playing means and the rewind means.

4,513,336

CASSETTE TAPE RECORDER

Kobun Yoshida, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,844
Claims priority, application Japan, Sep. 2, 1981, 56-130488[U]
Int. Cl.³ G11B 5/54
U.S. Cl. 360—105 **7 Claims**



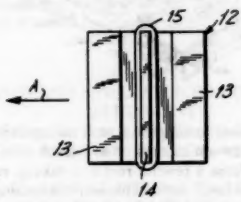
1. A cassette tape recorder comprising, a chassis of the type receiving a cassette tape at a fixed position thereon, at least one magnetic head for magnetically interacting with said cassette tape when positioned at a forward position with respect to a surface of said cassette tape, a head plate, a head base fixed to said head plate, said at least one magnetic head fixed to said head base, said head plate being slidably moveable relative to said chassis to move said at least one head towards said surface of said cassette tape in accordance with a record-playback operation of said recorder, said tape cassette being of the type having a guide pin thereon, means on said head base engageable with said guide pin for positioning said at least one head at said forward position when said engageable means is in contact with said guide pin.

4,513,337

MAGNETIC HEAD FOR PERPENDICULAR MAGNETIZATION RECORDING

Shin Shibata; Akira Aoyama, and Tetsuya Mino, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Japan

Continuation of Ser. No. 294,086, Aug. 19, 1981, abandoned. This application Feb. 27, 1984, Ser. No. 602,621
Claims priority, application Japan, Aug. 20, 1980, 55-114171
Int. Cl.³ G11B 5/27, 5/22
U.S. Cl. 360—121 **10 Claims**



1. A recording head for perpendicular magnetization recording of a magnetic recording medium, said medium including a recording film having a direction of travel and an easy axis of magnetization perpendicular to the plane of the magnetic recording medium and a layer of a high permeability backing said recording film, comprising:

a core including a first magnetic pole and two second magnetic poles, said first pole having a shorter width than said second magnetic poles parallel to said direction of travel and in the plane of the medium, said first and second magnetic poles having equal length extending transversely to said direction of travel and parallel to the plane of the medium and being physically spaced apart in the direction of travel of said recording medium relative to said recording head and magnetically coupled together, an exciting coil wound on said core, said first and second poles being dimensioned for keeping said first and second magnetic poles at different magnetic potentials when said coil is excited, said two second magnetic poles being disposed one on each side of said first magnetic pole and spaced apart therefrom in said direction of travel of said recording medium, said first and second magnetic poles being positioned in opposition to the same face surface of said magnetic recording medium recording on said medium, whereby magnetic flux lines induced between said poles and passing through said medium are parallel to said direction of travel.

4,513,338

WHIP ANTENNA HIGH VOLTAGE PROTECTION DEVICE

Steve R. Goodall, Ocean; Palemon W. Dubowicz, and Donn V. Campbell, both of Eatontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 1, 1984, Ser. No. 575,973
Int. Cl.³ H02H 9/04
U.S. Cl. 361—1 **5 Claims**

1. Apparatus for protecting from external high voltage power sources an elongated radio antenna having top and bottom antenna sections, said top and bottom antenna sections respectively having first and second antenna conductor elements including screw thread means, said top antenna section including an insulating covering surrounding said first antenna conductor element, said covering having a cylindrical cavity portion formed therein at the lower end thereof exposing a portion of the first antenna conductor element and screw thread means thereof, said apparatus comprising a high voltage series connected capacitance device exhibiting a very high capacitive reactance at power line frequencies and a relatively low capacitive reactance at radio frequencies, said capacitance device having inner and outer mutually separated coaxial conductors respectively coupled between said top and bottom

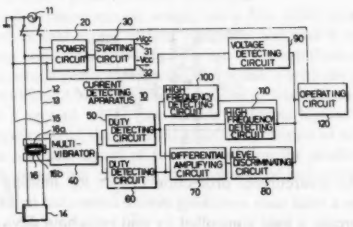
antenna sections, said inner conductor being connected to said first antenna conductor element and said outer conductor being connected to said second antenna conductor element, said inner and outer conductors including coupling means comprising respective screw thread means engageable with the screw thread means of said antenna conductor elements for connecting said inner and outer conductors to said first and second antenna conductor elements respectively, and an electrically insulating covering surrounding said outer conductor, so that the upper end of said capacitance device is insertable into said cavity and the screw thread means of the first conductor element engage the screw thread means of said inner conductor, whereby damage to the antenna or radio connected thereto is prevented and personnel are protected from injury in the event the antenna contacts an external power source.

4,513,339

CURRENT DETECTING APPARATUS

Yoshihisa Ishigami; Yasumasa Hashimota; Tadaharu Kitado; Hiromi Nishimura, and Tetsuo Mori, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 29, 1983, Ser. No. 527,224
Claims priority, application Japan, Sep. 10, 1982, 57-158551
Int. Cl.³ H02H *3/28*
U.S. Cl. 361—45 **7 Claims**



1. A current detecting device comprising a power circuit providing a D.C. power to respective parts of said device, an operating circuit for driving an associated external device, a saturable reactor operatively associated with lines through which a current to be detected flows and provided with secondary and tertiary windings for detecting said current to be detected, a multivibrator circuit connected to said saturable reactor responsive to the value of the current to be detected and providing two outputs, a pair of duty detecting circuits respectively receiving each of said two outputs of said multivibrator circuit, a level discriminating circuit for discriminating level difference between outputs of said duty detecting circuits and energizing said operating circuit when said level difference exceeds a predetermined discrimination level, and a high frequency oscillation detecting circuit connected to the duty detecting circuits independently of said level discriminating circuit for detecting the oscillation of the saturable reactor and energizing the operating circuit.

4,513,340

POWER TRANSMISSION LINE PROTECTIVE APPARATUS

Robert E. Drain, Butte, Mont., assignor to The Montana Power Company, Butte, Mont.

Filed Dec. 13, 1982, Ser. No. 448,938
Int. Cl.³ H02H *3/28*
U.S. Cl. 361—62 **6 Claims**

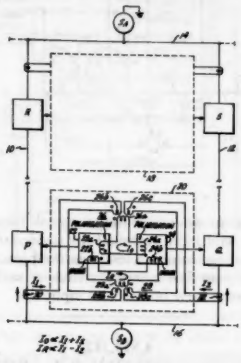
1. A protective system for parallel connected alternating current transmission lines interconnecting independent electrical power sources and having approximately equal line impedances, said protective system comprising:

independent line-opening circuit breakers connected in each of the respective lines at one end thereof;

separate directional relays each respectively associated with one of the circuit breakers and connected to trip its associated circuit breaker when energized by operating current at and above relay pickup level, each of said relays having a polarization winding and an associated operate winding;

current detectors coupled to each of the respective transmission lines, said current detectors each individually operable to derive a control current proportional to the line current in its associated transmission line;

means connected to said current detectors for producing a summation current for energizing said polarization windings of said directional relays in proportion to the sum of the control currents derived by the current detectors; and



means connected to said current detectors for producing a difference current for energizing each operate winding of said directional relays said difference current being proportional to the control current derived from one line subtracted from that derived from the other line such that the phasing between the summation and difference currents respectively energizes the polarization and operate windings of one of the relays, associated with a faulted transmission line, to cause that relay to pick up with its operate winding energized above a predetermined level while the other relay, associated with the nonfaulted line, does not pick up, the relative phasing in said polarization winding of the nonfaulted line relay being opposite the phasing in said faulted line relay.

4,513,341

OVERVOLTAGE PROTECTION CIRCUIT FOR POWER SUPPLY

Miklos J. Kollanyi, Cupertino, Calif., assignor to GTE Lenkurt Incorporated, Phoenix, Ariz.

Filed Jul. 25, 1983, Ser. No. 516,503
Int. Cl.³ H02H *3/20*
U.S. Cl. 361—91 **15 Claims**

1. Apparatus responsive to an overvoltage indication from an overvoltage sensing circuit of a power supply for interrupting electrical connection of a pair of input lines that are connected between the power supply and a power source, comprising:

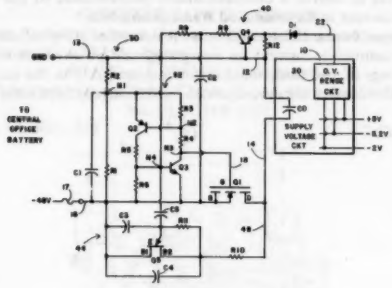
first means having a primary conduction path thereof electrically connected in series in one of the power supply input lines, said first means conducting substantial current in said primary conduction path in said one line in response to a prescribed control voltage of greater than a prescribed value applied to a control lead thereof;

second means electrically connected across the input lines for developing said control voltage of greater than the prescribed value at a node therebetween when the input lines are connected to the power source;

third means for electrically connecting said node to the control lead of said first means for causing the latter to

conduct current through the power supply when the control voltage is greater than the prescribed value; and

latch means electrically connected between said node and said one input line and having an input terminal connected to the overvoltage sensing circuit, said latch means being



responsive to an overvoltage signal from said sensing circuit on said input terminal for decreasing the value of control voltage to much less than the prescribed value for cutting off said first means for causing said first means to block current flow in said one input line.

4,513,342

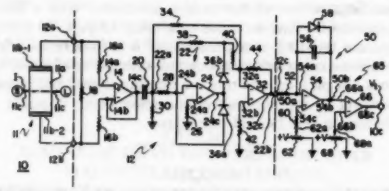
CURRENT-SQUARED-TIME (I^2T) PROTECTION SYSTEM

Henry A. F. Rocha, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,271

Int. Cl.³ H02H *3/093*

U.S. Cl. 361—94 **10 Claims**



1. A system for protecting a load component operating by a flow of AC current from damage due to excessive current-time heating, comprising:

means for directly sensing the square of the instantaneous magnitude (i) of the AC current flowing through said load component to provide a sensing means output signal (i^2);

fixed-gain signal conditioning means for providing an output signal linearly varying as said square of the load component AC current (i^2) directly sensed by said sensing means;

self-resetting means for singly integrating, with respect to time, the signal conditioning means output signal only while the root-mean-square value of the load component current exceeds a preselected normal load component current (I_N) and providing an integrated conditioned signal equal to

$$c \int_0^t (i^2 - I_N^2)\, dt,$$

where c is a constant; and

means for providing a trip signal only if the integrated conditioned signal value exceeds a preselected current square-time value, to cause current flow through said load component to terminate.

4,513,343

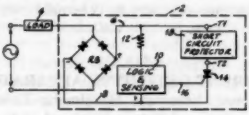
SHORT CIRCUIT PROTECTOR HAVING FOLD-BACK TRIP POINT FOR SOLID STATE SWITCHING DEVICE

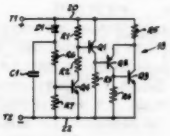
Lawrence J. Ryczek, Nashotah, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,206

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—101 **5 Claims**





1. An overcurrent protection circuit for limiting current flow to a solid state switching device connected in series with said circuit, a load controlled by said switching device, and a full wave rectified DC source, said circuit comprising, in combination:

means rendering said circuit conductive in a low impedance state upon application of DC power to said circuit;

first detection means for sensing current in said circuit and causing said circuit to switch to a high impedance state when said current exceeds a first predetermined value and for connecting a second detection means in said circuit, said second detection means being responsive to a second predetermined current value less than said first predetermined current value for causing said circuit to switch to said high impedance state;

means switching said circuit to said low impedance state at the end of each half-cycle of DC power applied to said circuit; and

capacitor means for maintaining said second detection means connected in said circuit for subsequent successive half-cycles until said current does not exceed said second predetermined value.

4,513,344

PROTECTIVE RELAY FOR POWER SYSTEM

Masaji Usui, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,066

Claims priority, application Japan, Dec. 29, 1981, 56-212415; Mar. 5, 1982, 57-35383; Mar. 5, 1982, 57-35391; Mar. 5, 1982, 57-35392; Mar. 5, 1982, 57-35393

Int. Cl.³ H02H *1/00*

U.S. Cl. 361—113 **4 Claims**

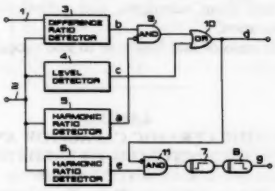
1. A protective relay which generates signals to protect an object in a power system that is to be protected in response to a differential signal and a suppress signal obtained from electric

currents that are detected from two separate points of the object, said protective relay comprising:

first detection means which produces a signal of first condition when said differential signal is greater than said suppress signal by more than a predetermined ratio;

second detection means which produces a signal of second condition when the level of said differential signal becomes greater than a predetermined value;

third and fourth detection means which produce a signal of third condition and a signal of fourth condition, respectively, when the second harmonic component contained in said differential signal is greater than the fundamental



wave component contained in the differential signal by more than a predetermined ratio; and

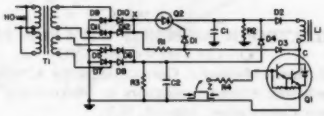
a logical decision circuit which has a first AND gate that receives said signal of first condition and that is opened when said signal of third condition is not supplied, an OR gate which performs logical OR operation with the output of said first AND gate and said signal of second condition, and a second AND gate which performs logical AND operation with the inverted logic of the output of said OR gate and said signal of fourth condition for producing a lock signal for disabling the function of said protective signal.

4,513,345

CONTROL CIRCUIT FOR INDUCTIVE LOAD

Stephen T. Pasquarella, Rochester, N.Y., assignor to Va. Inc., Rochester, N.Y.

Filed Sep. 2, 1983, Ser. No. 529,100
Int. Cl.³ H01H 47/22
U.S. Cl. 361—155 **4 Claims**



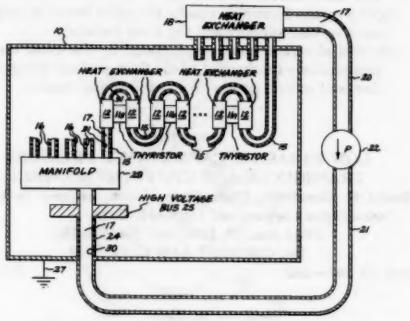
1. A control circuit for an inductive load comprising an initiating capacitor, switch means, means for connecting the capacitor and the switch means in series circuit with an inductive load, with the load being between the capacitor and the switch means, a rectifier, a triggerable avalanche device, means connecting the avalanche device between the rectifier and one terminal of the capacitor for charging the capacitor during times when the avalanche device is turned ON, and means connecting the gate electrode of the avalanche device to the switch means, the switch means being effective when in its closed condition to hold the gate electrode of the avalanche device at a voltage below the trigger voltage of the avalanche device.

4,513,346

MEANS TO IMPROVE THE DIELECTRIC PERFORMANCE OF AN INSULATIVE CONDUIT WITH A FLOW OF LIQUID DIELECTRIC COOLANT THEREIN

John C. Devins, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 259,396, May 10, 1981, abandoned. This application Apr. 27, 1983, Ser. No. 488,913
Int. Cl.³ H05F 3/00
U.S. Cl. 361—212 **22 Claims**



1. An apparatus to improve the dielectric performance of an insulative conduit containing a flowing liquid dielectric coolant therein, wherein a high voltage is impressed between two conductors which are spaced along the length of said insulative conduit, which conductors are in contact with said liquid dielectric coolant, said apparatus comprising:

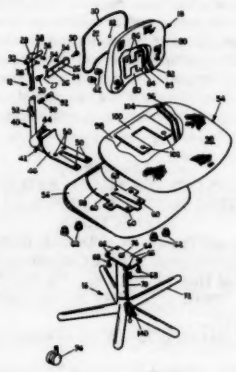
a low conductance path connected between said two spaced conductors and in contact with said liquid dielectric coolant, said low conductance path having a minimum conductance in excess of about the conductance value corresponding to a resistance per unit length of said low conductance path of 5×10^8 ohms/cm.

4,513,347

STATIC PROTECTIVE CHAIR

Jeffrey S. Wilcox, Grand Rapids, and James H. Nienhuis, Wyoming, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Jul. 28, 1983, Ser. No. 518,082
Int. Cl.³ H05F 3/02
U.S. Cl. 361—212 **24 Claims**



1. A chair adapted to continuously discharge electrostatic

charges which may be generated or carried by a chair user, said chair comprising:

a conductive base support having a bottom portion adapted to stand on a floor surface;

a seat including an insulating shell mounted to the base;

a backrest including an insulating shell mounted to the base;

a conductive upholstery material on said seat and backrest;

first means passing through said insulating shells forming a conductive path free of insulating materials between said conductive upholstery material on said seat and backrest and said conductive base; and

second means forming a conductive path between said conductive base support and the floor surface;

wherein electrical charges generated by the chair user are continuously discharged to the floor surface through said first and second conductive pathforming means.

4,513,348

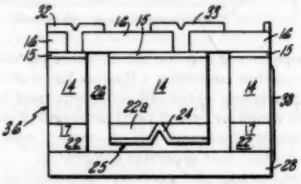
LOW PARASITIC CAPACITANCE PRESSURE TRANSDUCER AND ETCH STOP METHOD

Daniel H. Grantham, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 13, 1984, Ser. No. 570,552

Int. Cl.³ H01G 7/00; G01L 9/12

U.S. Cl. 361—283 **2 Claims**



1. A silicon capacitive pressure transducer comprising:

a thick layer of silicon having a moat extending therethrough thereby forming a central pedestral and the wall of a vacuum chamber with said pedestal disposed therein;

a layer of borosilicate glass disposed on the bottom of said wall;

a wafer of silicon bonded to said borosilicate glass forming the bottom wall of said chamber, and one of the plates of the capacitor, the other plate of the capacitor being the bottom of said pedestal;

a thin layer of aluminum on the upper edges of said pedestal and said wall; and

a layer of borosilicate glass disposed on said aluminum layer and across the upper end of said moat to form the top of said vacuum chamber and to form a hinge that allows the pedestal to move upwardly and downwardly with external pressure variations, thereby altering the capacitance of the capacitor, there being electrical contacts made through said upper borosilicate glass layer.

4,513,349

ACRYLATE-CONTAINING MIXED ESTER MONOMERS AND POLYMERS THEREOF USEFUL AS CAPACITOR DIELECTRICS

Daniel R. Olson, and Timothy W. O'Donnell, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,872

Int. Cl.³ H01G 4/18; C08F 20/20; C07C 69/54

U.S. Cl. 361—311 **23 Claims**

6. An ester mixture prepared by reacting sequentially, in either order,

a polyhydroxy compound having the formula $R^1(OH)_n$, wherein R^1 is an aliphatic, alicyclic or mixed aliphatic-alicyclic radical having about 10–40 carbon atoms which optionally contains up to about three non-conjugated olefinic linkages and n is from 2 to 4, with

a first carboxylic acid having the formula

$$CH_2=C(R^2)-COOH,$$

wherein R^2 is hydrogen or methyl, or a functional derivative thereof, and

a second carboxylic acid having the formula R^3COOH, or a functional derivative thereof, wherein R^3 is an aliphatic hydrocarbon radical containing about 2–20 carbon atoms and free from acetylenic and polymerizable ethylenic unsaturation,

the mole ratio of said first acid to said second acid being at least 1:1.

4,513,350

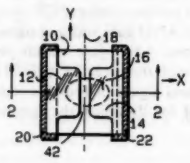
MONOLITHIC CERAMIC CAPACITOR AND METHOD FOR MANUFACTURING TO PREDETERMINED CAPACITY VALUE

James H. Coleman, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed Feb. 2, 1984, Ser. No. 576,497

Int. Cl.³ H01G 3/07, 3/26

U.S. Cl. 361—321 **15 Claims**



1. A monolithic ceramic capacitor comprising a ceramic body substantially of right-parallelepiped shape, first and second buried electrodes lying in one plane within said body and being separated from each other by a gap about in the middle of said body, each of said first and second electrodes extending outward to opposite faces of said body for electrical access thereto, a third and floating buried electrode not extending to a body face and lying in another plane that is spaced from and parallel to said one plane, the area of overlap between said floating and first electrodes being greater than the area of overlap between said floating and said second electrodes.

4,513,351

ELECTRONIC ASSEMBLY WITH FORCED CONVECTION COOLING

Michael I. Davis; Michael J. Garrett, and John A. Wiseman, all of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1983, Ser. No. 536,122

Claims priority, application European Pat. Off., Sep. 29, 1982, 82305175.0

Int. Cl.³ H05K 7/20

U.S. Cl. 361—384 **4 Claims**

1. An electronic assembly with forced convection cooling, comprising

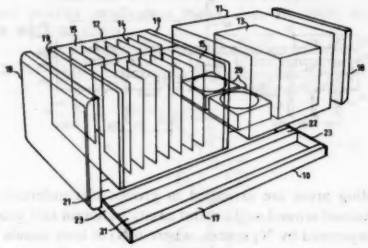
an elongated support plate,

a plurality of electronic equipment cabinets with electrical components therein mounted side by side on a common surface of the plate in the longitudinal direction thereof,

said support plate having at least one air distribution channel extending longitudinally of the plate in said common surface and open to the equipment cabinets and closed at

its ends for air distribution between the cabinets and the channel,

and a cooling fan mounted in one of the cabinets at a longitudinal position of the channel and forcing air (1) between the fan and the cabinets and cooling some of the electrical



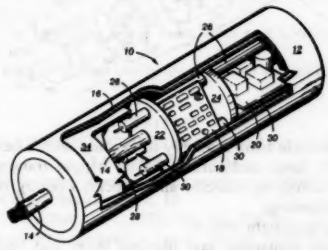
components therein and (2) along the air distribution channel in opposite direction between the fan and each of said ends and (3) between the air distribution channel and the cabinets for other cooling of electrical components therein.

4,513,352

THERMAL PROTECTION APPARATUS

Gloria A. Bennett; Michael G. Elder, both of Los Alamos, and Joseph E. Kemme, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 20, 1984, Ser. No. 591,650
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—385 **5 Claims**



1. Apparatus which thermally protects heat-sensitive components in tools used in geothermal boreholes, said apparatus comprising:

a. a housing;

b. a Dewar disposed within said housing;

c. thermally conductive bulkheads disposed within said Dewar and on either side of and thermally communicating with the heat-sensitive components;

d. a heat sink of suitable temperature disposed within said Dewar; and

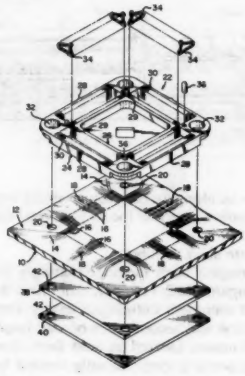
e. a heat pipe conducting heat from the components through said bulkheads and to said heat sink.

4,513,353

CONNECTION OF LEADLESS INTEGRATED CIRCUIT PACKAGE TO A CIRCUIT BOARD

Johannes C. W. Bakermans, Harrisburg, Pa.; Dimitry G. Grabbe, Lisbon Falls, Me., and Iosif Korsunsky, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 27, 1982, Ser. No. 453,074
Int. Cl.³ H05K *1/18*
U.S. Cl. 361—399 **7 Claims**



1. A device for connecting a leadless integrated circuit chip carrier or package to a circuit board, comprising:

a circuit board having electrical conductors contained thereon;

mask means disposed on said circuit board thereby covering said electrical conductors contained thereon, said mask being selectively omitted from at least one portion of said circuit board thereby leaving exposed contact area on said electrical conductors and thereby defining a rib locating slot;

generally rectangular chip carrier housing means disposed on said circuit board for receiving a leadless integrated circuit chip carrier, said housing means having outer walls and interior walls said interior walls attached to said outer walls at each corner of said chip carrier housing;

outer and interior spacing barrier wall means in opposing relationship to each other disposed perpendicularly to said outer and said interior walls thereby defining a slot for receiving an electrically conductive contact and forming a space between outer and interior spacing barrier walls so as to minimize stray inductance and capacitance between electrical contacts disposed in adjacent slots;

an electrically conductive contact disposed in each of said slots for providing electrical communication between a leadless integrated circuit chip carrier and said electrical conductors contained on said circuit board;

at least one locating rib means disposed on said chip carrier housing means for engageably engaging said rib locating slot thereby allowing proper alignment of said contacts contained in said housing means with said electrical conductors contained on said circuit board;

a leadless integrated circuit chip carrier disposed on said housing means; and

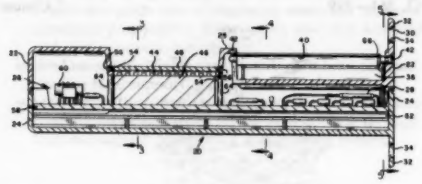
a plurality of chip carrier retaining bracket means disposed on said housing means for maintaining conductors contained on said integrated circuit chip carrier in aligned electrical contact with said contacts contained in said chip carrier housing means, said retaining brackets being generally rectangular and each of which is pivotally attached at one end to said chip carrier housing means and having latching slots at the remaining end for interlocking with pivot points of adjacent chip carrier retaining brackets.

4,513,354

HOUSING FOR AN ELECTRONIC CIRCUIT BOARD

William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.

Filed Sep. 26, 1983, Ser. No. 535,864
Int. Cl.[3] H05K 1/18
U.S. Cl. 361—399 22 Claims



1. A housing for an elongate electronic circuit board having a deformation-sensitive portion located at one end thereof, comprising:

(a) a first elongate shell member;

(b) a second elongate shell member matingly joined with said first elongate shell member, said first and second elongate shell members defining a cavity therebetween and defining first and second ends of said housing;

(c) support rail means located in said first elongate shell member and extending longitudinally therein from a location adjacent said first end toward said second end, for supporting a first side of an elongate circuit board within said cavity by contact against respective longitudinal marginal portions thereof;

(d) support pin means, located in said second elongate shell member opposite said support rail means, for supporting a second side of said elongate circuit board by contact against respective longitudinal marginal portions of said second side of said elongate circuit board; and

(e) said support rail means extending longitudinally of said first shell member from said first end a distance more than half but less than the entire length of said first shell member, and said cavity being free from said support rail means and support pin means over a predetermined distance from said second end, and said housing defining protective means for enclosing within said cavity a self-supporting deformation-sensitive portion of said circuit board extending beyond said support rail means toward said second end without contact between either of said first and second shell members and said deformation-sensitive portion when said circuit board is held in said cavity with said support rail means and support pin means supporting said respective longitudinal marginal portions.

4,513,355

METALLIZATION AND BONDING MEANS AND METHOD FOR VLSI PACKAGES

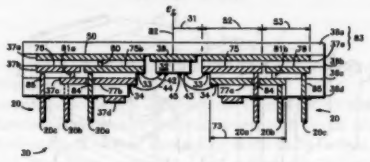
Jack A. Schroeder, Scottsdale, and Ernel R. Winkler, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1983, Ser. No. 504,696
Int. Cl.[3] H01L 23/02, 23/12, 39/02
U.S. Cl. 361—403 14 Claims

1. A device enclosure for containing a device with bonding pads, comprising:

N_1 lead runs arrayed on a first level, wherein said N_1 lead runs extend toward a central cavity adapted to contain a device, wherein each of said N_1 lead runs terminates in a first bonding area adapted to receive a first connection from a corresponding one of said bonding pads on said device, wherein at least one of said first bonding areas has associated therewith a first bond location indicator having a predetermined position defining a preferred bonding path from said one of said bonding pads to said corresponding bonding area; and

N_2 lead runs arrayed on a second level, different from said first level, wherein said N_2 lead runs extend toward said central cavity, wherein $N_2 > N_1$, wherein each of said N_2 lead runs terminates in a second bonding area adapted to receive a second connection from a corresponding other of said bonding pads on said device, wherein said second



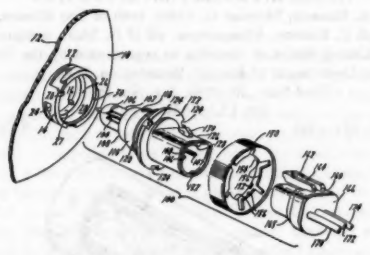
bonding areas are arranged in groups circumferentially positioned around said central cavity, wherein said groups are separated by N_3 spaces, wherein N_3 at least equals N_1, and wherein each of said N_3 spaces is aligned so as to be located substantially on an extension of a line drawn along said preferred bonding path.

4,513,356

REPLACEABLE LAMP ASSEMBLY AND LOCKING MECHANISM FOR A SEALABLE REFLECTOR HOUSING

James A. Mikola, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 339,194, Jan. 13, 1982,. This application Apr. 29, 1983, Ser. No. 474,374
Int. Cl.[3] H01R 33/00
U.S. Cl. 362—226 9 Claims



1. A replaceable lamp assembly for mating with a hermetically sealable lamp enclosure including a light transmitting lens, a light directing reflector and a socket opening in said reflector comprising:

a filament lamp light source;

plug means, containing said filament lamp, and having a body portion formed to be axially inserted into said socket opening, wherein said plug means includes means for supporting said lamp so that the filament of said lamp is located at a predetermined point and in a predetermined orientation with respect to said body portion, and means for sealing said lamp enclosure when said plug means is inserted into said socket opening;

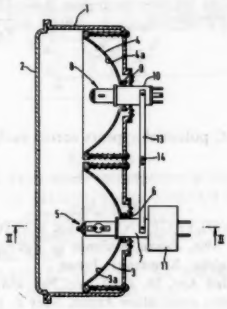
a base flange extending transverse to said body portion and having a diametric dimension larger than that of said socket opening for limiting the insertion distance of said plug means into said socket opening; and

means surrounding said base flange of said plug means and said socket for locking said plug means in said socket.

4,513,357
HEADLAMP UNIT WITH TIMED SWITCHING BETWEEN TWO LIGHTS

Yasuhiro Nieda, Yokosuka, and Kiyokazu Honda, Zushi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 17, 1984, Ser. No. 571,492
Claims priority, application Japan, Jan. 19, 1983, 58-6988; Jan. 19, 1983, 58-6989
Int. Cl.³ F21M *15/00*
U.S. Cl. 362—228 2 Claims



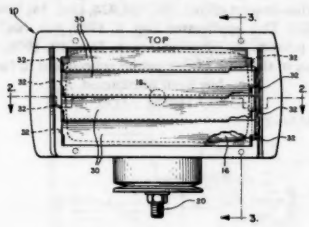
1. A headlamp unit for motor vehicles comprising:
a first light beam unit which comprises:
an incandescent lamp;
a first reflector means for reflecting light from said incandescent lamp wherein said incandescent lamp is disposed at about a focus of said first reflector means;
a second light beam unit which comprises;
a high intensity discharge lamp;
a second reflector means for reflecting light from said high intensity lamp, wherein said high intensity light is disposed at about a focus of said second reflector means;
timing means for stopping the lighting of said first light beam unit after a predetermined time approximating the time necessary for said second light beam unit to obtain a stable operation;
means for providing a high beam from said first light beam unit;
means for providing a high beam from said second light beam unit;
means for providing a low beam from said first light beam unit; and
means for providing a low beam from said second light beam unit.

4,513,358
LAMP COMPRISING AUTOMATICALLY ACTUATED LOUVER SYSTEM

Charles D. Lemme, Tucson, Ariz., assignor to Blazer International Corp., Franklin Park, Ill.

Filed Jul. 1, 1983, Ser. No. 510,207
Claims priority, application Japan, Sep. 21, 1982, 57-141917
Int. Cl.³ F21V *17/02*
U.S. Cl. 362—276 18 Claims

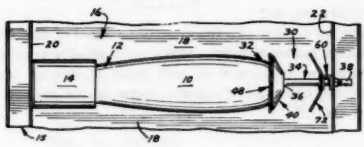
1. In a lamp comprising a lamp housing, a light source and a lens, the improvement comprising:
a louver system;
means for mounting the louver system to the housing such that the louver system is positioned in front of the lens and is movable between an open position, in which the louver system allows light from the light source to be projected forwardly, and a closed position, in which the louver system covers the lens;
a heat driven actuator coupled to the louver system to move the louver system to the open position when heat is applied to the actuator and to move the louver system to the closed position after the light source has been deactivated and the application of heat to the actuator has stopped;
means for automatically heating the actuator when the light source is actuated; and
a resilient overload protection element coupled between the heat driven actuator and the louver system to transmit louver actuating forces generated by the heat driven actuator to the louver system, said overload protection element having a sufficiently high resistance to distortion to transmit said actuating forces to the louver system and a sufficiently low resistance to distortion to bend and thereby to protect the heat driven actuator from excessive stretching forces transmitted to the overload protection element by the louver system.



4,513,359
LAMP STABILIZER

Wayne G. Nielson, Hutchinson, Minn., assignor to Sterner Lighting Systems, Incorporated, Winsted, Minn.

Filed Aug. 22, 1983, Ser. No. 525,233
Int. Cl.³ F21V *21/06*
U.S. Cl. 362—389 19 Claims



1. A lamp stabilizer comprising:
(a) mount means adapted to be mounted with respect to a light fixture;
(b) an elongated rigid rod slidably mounted for movement along its axis with respect to the mount means;
(c) a lamp engaging socket having a base portion, an open end portion and an inner surface, the base portion of the lamp engaging socket being fixedly secured to one end of the rod and positioned such that an outer end of a lamp mounted in the electrical lamp socket of a light fixture mounting the mount means is received within the open end portion of the socket;
(d) friction clip means for adjustably limiting movement of the rod along its axis in direction away from such a lamp; and
(e) heat insulating and lamp cushioning means secured to the inner surface of the lamp engaging socket adjacent its open end portion for engagement with the outer end of such a lamp.

4,513,360

DC-DC CONVERTER HAVING ENERGY STORAGE INDUCTANCE ELEMENT CONNECTED IN FLYWHEEL CIRCUIT

Tsuneo Ikenoue, 14-6, Ichiban-cho 1-chome, Sendai-shi, Miyagi; Shin-yng Liu, Miyagi; Naoki Arai, Tokyo, and Shuichi Umemoto, Kanagawa, all of Japan, assignors to Tsuneo Ikenoue; Tohoku Ricoh Co., Ltd.; Stanley Electric Co., Ltd. and Micron Kiki Co. Ltd., all of Tokyo, Japan

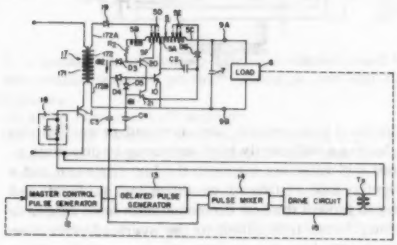
Continuation-in-part of Ser. No. 216,924, Dec. 16, 1980, Pat. No. 4,357,654. This application Sep. 2, 1982, Ser. No. 413,991

Claims priority, application Japan, Dec. 19, 1979, 54-165012

The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.

Int. Cl.³ H02M *3/335, 3/155*

U.S. Cl. 363—20 **5 Claims**



1. A DC-DC converter of the type in which an inductance element stores energy when a main switching transistor having a control electrode is turned on and releases the stored energy when the main switching transistor is turned off, comprising:

a semiconductor active element used as a flywheel element which is turned off when said main switching transistor is turned on, and is turned on when said main switching transistor is turned off so as to provide a path for the current established by said release of said stored energy, said active element having a control terminal, said inductance element comprising a coil with a tap, connected in circuit so that the voltage induced between one end of said coil and said tap causes said semiconductor active element to turn on; and

means for applying to the control terminal of said semiconductor active element a signal substantially synchronized with the operation of said main switching transistor thereby causing said semiconductor active element to turn on and off.

4,513,361

MULTI-PHASE DC-TO-AC AND DC-TO-DC BOOST CONVERTER

Loman Rensink, Tujunga, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 15, 1983, Ser. No. 466,404

Int. Cl.³ H02M *3/335*

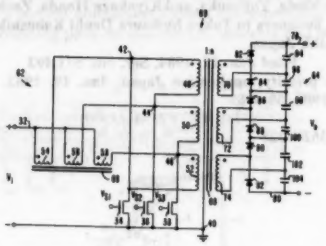
U.S. Cl. 363—21 **12 Claims**

1. A multi-phase voltage boost converter comprising:

(a) a plurality of transformer primary windings electrically interconnected in a single loop mesh configuration;

(b) a plurality of voltage boosting phase-channels electrically connected with said primary windings and commonly connected to a low voltage power source; and

(c) means for controlling said phase-channels such that each said phase-channel periodically provides a boosted voltage potential to said primary windings, the periodic boosted voltage potential being provided in a continuously cycling, multi-phase synchronous relationship to one another so that a corresponding multi-phase, high-



voltage AC potential appears across each of said primary windings.

4,513,362

VOLTAGE INVERTER DEVICE

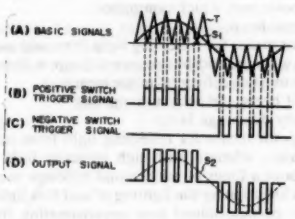
Yukio Aizawa, Mie, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 26, 1983, Ser. No. 488,811

Claims priority, application Japan, May 6, 1982, 57-75835

Int. Cl.³ H02M *7/217*

U.S. Cl. 363—41 **9 Claims**



1. A voltage inverter device for turning a main circuit switch on/off so as to convert a DC input voltage into an AC output voltage, comprising:

frequency setting means for setting an output frequency of the AC output voltage;

voltage/frequency converting means, connected to said frequency setting means, for producing pulses the number of which is proportional to the output frequency in response to a voltage signal supplied from said frequency setting means;

address counter means, connected to said voltage/frequency converting means, for counting the pulses from said voltage/frequency converting means and for producing an address signal;

electrical angle counter means, connected to said address counter means, for producing an electrical angle signal every time a count of said address counter means reaches a value corresponding to a predetermined electrical angle of the AC output-voltage;

memory means, connected to said address counter means, for reading out data stored therein in advance in response to the address signal;

oscillating means for generating a clock signal;

time counter means, connected to said oscillating means, for counting the clock signals so as to count time corresponding to the predetermined electrical angle;

comparing means, connected to said time counter and said memory means, for comparing data from said memory means with data from said time counter means;

logical circuit means, connected to said comparing means

and said electrical angle counter means, for generating a signal which turns said main circuit switch on/off in accordance with a comparison signal from said comparing means and the electrical angle signal from said electrical angle counter means; and

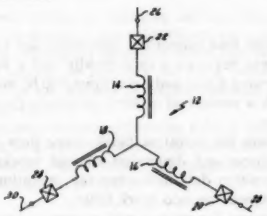
count control means, connected to said voltage/frequency converting means and said comparing means, for clearing a content of said time counter means in synchronism with the comparison signal from said comparator means so as to be ready to resume time counting for the next electrical angle, and stopping said time counter means when the count of said time counter means reaches a predetermined count.

4,513,363

STRUCTURE FOR AND METHOD OF REDUCING IMPEDANCE IN MULTIPHASE DIRECT CURRENT POWER SUPPLIES

John F. Farrow, Plymouth, Mich., assignor to Medar, Inc., Farmington Hills, Mich.

Filed Feb. 22, 1982, Ser. No. 350,987
Int. Cl.³ H02M *7/06*
U.S. Cl. 363—126 **19 Claims**



1. In a multiphase direct current power supply including separate input energy phase lines, a transformer primary circuit including Y connected transformer primary windings having one, inner end connected together, the other, outer ends of the transformer primary windings being connected to the separate input energy phase lines and means connected in circuit with the primary circuit Y connected transformer primary windings for limiting current conduction through the transformer primary windings to current flowing only through two of the transformer primary windings in series at any one time.

4,513,364

THERMALLY CONTROLLABLE VARIABLE FREQUENCY INVERTER

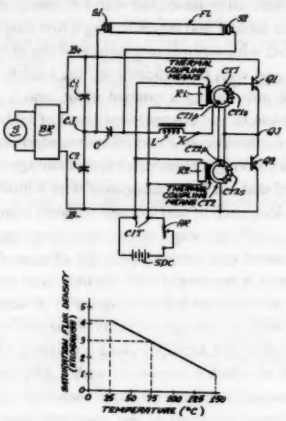
Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Continuation-in-part of Ser. No. 178,107, Aug. 14, 1980, abandoned. This application Oct. 24, 1983, Ser. No. 544,567
Int. Cl.³ H02M *7/537*
U.S. Cl. 363—132 **6 Claims**

1. In an inverter circuit having at least one periodically conducting transistor in circuit with a DC voltage input and being operable to provide an AC voltage output, the improvement comprising:

drive current means comprising at least one saturable inductor means for providing transistor drive current to control the conduction period thereof; and

heating means for controllably heating the saturable inductor means, thereby to correspondingly decrease the saturation flux density and saturation time thereof, and



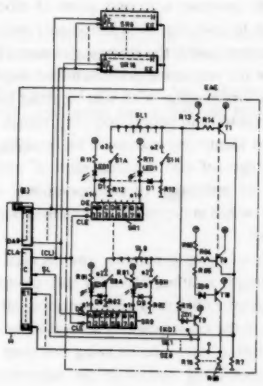
thereby to correspondingly increase the transistor inversion frequency.

4,513,365

FUNCTION SELECTOR

Reinhard Franz, Tulpenstrasse 15, D-5401 Emmelshausen, Fed. Rep. of Germany; Wilfried Dittmar, Halsenbach, and Günter Daubach, Leverkusen, both of Fed. Rep. of Germany, assignors to Reinhard Franz, Emmelshausen, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,252
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204787
Int. Cl.³ G06F *15/46;* **G09B** *15/08;* **G10G** *1/02*
U.S. Cl. 364—140 **33 Claims**



1. An arrangement for indicating the operational status of switches, particularly for use in electronic musical instruments, comprising:

(a) a plurality of groups of switches, said switches being individually operable between ON and OFF states to cause the performance of selected functions;

(b) an indicator connected with each of said switches and designed to indicate the operational state of the respective switch;

(c) a plurality of devices each having a first input, a clocking input, and a series of stages designed to receive signals in

a predetermined sequence via the first input in response to the delivery of clocking pulses to the clocking input, each of said devices being associated with a different one of said groups, and each of said stages having a first output which is connected with a respective switch of the corresponding group and with the indicator for the switch;

(d) a control unit having a control input, and a clocking input common to and connected with all of said clocking inputs of said devices, said control unit comprising at least one memory having a plurality of sets of storage elements, and each of said sets being associated with a different one of said devices, each of said storage elements being associated with a different stage of the corresponding device, and said control unit having a plurality of second outputs each of which is connected with the first input of a different one of said devices and is designed to be sequentially connected with the storage elements of the corresponding set, said control unit further having a plurality of second inputs each of which is associated with a different one of said devices and is designed to be sequentially connected with the storage elements of the corresponding set, and said control unit being designed to generate a first series of clocking pulses subsequent to arrival of a control signal at said control input to thereby cause a reference signal to be advanced from one stage of each of said devices to another in the respective predetermined sequence, said reference signals resulting in the generation of identifying signals representative of the operational states of said switches, and each of said second inputs being connected with the storage elements of the associated set in substantial synchronism with the arrival of the reference signal at the corresponding stages to thereby permit information representative of said identifying signals to be stored in the respective storage elements, said control unit also being designed to generate a second series of clocking pulses subsequent to said first series, and said second outputs being connected with the storage elements of the associated sets in the respective predetermined sequence and in substantial synchronism with said clocking pulses of said second series so as to permit operating signals representative of said identifying signals to be furnished to the respective stages of said devices, each of said indicators providing an indication of the operational state of the associated switch in dependence upon the respective operating signal;

(e) a plurality of signal generating circuits each of which is associated with a different one of said groups and has a first conductor common to and connecting all switches of the group to the corresponding second input of said control unit, each of said circuits being designed to generate series of identifying signals in the respective predetermined sequence during said first series of clocking pulses and to transmit the series of identifying signals to the corresponding second input in the predetermined sequence, and each of said circuits also being designed to generate a control signal upon changing of at least one switch of the respective group to one of its states; and

(f) a second conductor for transmitting control signals to said control input, said second conductor being common to all of said switches and connecting all of said circuits with said control input.

4,513,366

MENU PROGRAMMED MACHINE TOOL NUMERICAL CONTROLLER WITH AN INTERFERENCE CHECKING FUNCTION

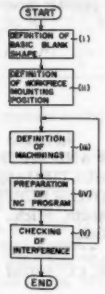
Kenichi Munekata; Yoshio Doi, both of Kariya; Isao Suzuki, Okazaki, and Shigeru Doi, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 15, 1983, Ser. No. 475,509

Claims priority, application Japan, Mar. 23, 1982, 57-45945

Int. Cl.[3] **G05B** *23/02, 9/02*

U.S. Cl. 364—167 **4 Claims**



2. In a machine tool numerical controller for controlling relative movement between a tool spindle and a work table respectively carrying a tool and a workpiece to be machined in accordance with a numerical control program, the improvement comprising:

data input means for inputting blank shape data indicating the blank shape and dimension of said workpiece and mounting position data indicating the mounting position of said workpiece on said work table;

data storage means for storing said numerical control program, said blank shape and mounting position data input by said data input means and a tool interference space defined outwardly from the outer periphery of said tool;

first calculation means connected to said data storage means for obtaining by calculation a workpiece interference space defined outwardly from the outer periphery of said workpiece, based upon said blank shape data and said mounting position data stored in said data storage means;

second calculation means connected to said data storage means for calculating based upon said numerical control program a tool path along which said tool spindle would be moved relative to said work table in accordance with said numerical control program; and

interference detection, means for detecting by calculation based upon said tool path, said tool interference space and said workpiece interference space, whether one of said tool and said tool interference space would be engaged with said workpiece interference space during any rapid feed positioning movement if relative movement between said tool spindle and said work table were controlled in accordance with said numerical control program.

4,513,367

CACHE LOCKING CONTROLS IN A MULTIPROCESSOR

Shiu K. Chan; John A. Gerardi, both of Poughkeepsie, and Bruce L. McGilvray, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,788

Int. Cl.[3] **G06F** *13/08*

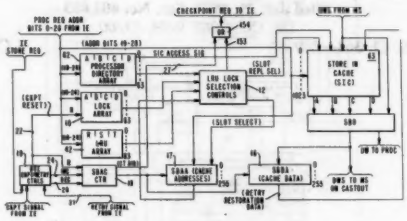
U.S. Cl. 364—200 **14 Claims**

1. In a MP having a plurality of central processors (CPs), each CP having an instruction execution (IE) unit, a store-in-cache and a cache directory that has a plurality of congruence

classes respectively addressed by selected bits from an IE requested logical address, each congruence class being set-associative with a plurality of entries, each entry including a valid bit to indicate the validity or invalidity of data in a cache location associated with the entry, and a replacement selection circuit for selecting an entry as a replacement candidate in each congruence class, each CP also comprising:

a lock bit associated with each entry in the CP's cache directory, a cache entry being in a locked state when an associated lock bit is in an on state to provide a locked entry,

means for modifying the replacement selection circuit to exclude each locked entry in the congruence class from



being a cache replacement candidate for the congruence class,

lock bit reset means for resetting the lock bits for all cache entries, the states of the valid bits of the cache directory not being affected by operation of the lock bit reset means,

means for setting on the lock bit for a cache entry being accessed by the address of a store operand request to the cache directory,

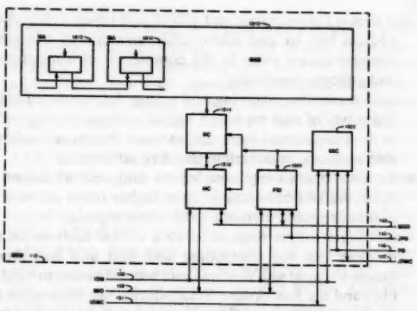
cache accessing means performing a fetch of cache data in response to a fetch request to the cache directory finding a valid cache entry without changing the state of the lock bit for the cache entry.

4,513,368

DIGITAL DATA PROCESSING SYSTEM HAVING OBJECT-BASED LOGICAL MEMORY ADDRESSING AND SELF-STRUCTURING MODULAR MEMORY

David L. Houseman, Cary, N.C., assignor to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,414
Int. Cl.³ G06F *4/36*
U.S. Cl. 364—200 **2 Claims**



1. A memory for use in a digital data system, comprising:

memory bank means (MSB 1810) comprising a plurality of memory array means (MA 1812) for storing data,

memory control means (MIC 1822, BC 1814) connected from certain portions (ATU 10228 via PD 10146, FIGS. 270 & 18) of said data system for receiving first addresses for controlling operation of said memory, for providing second addresses corresponding to said first addresses for controlling said memory bank means, said second addresses representing storage locations for said data in said memory bank means, and for conducting said data between said memory bank means and said certain portions of said digital data system, and

memory array bus means (within MSB 1810) connected from said memory control means and to each one of said plurality of memory array means in parallel for conducting said data and said second addresses between said memory control means and each one of said plurality of memory array means,

each one of said plurality of memory array means comprising

data storage means connected from said memory array bus means for storing said data, and

memory array address means connected from said memory array bus means and responsive to said second addresses for controlling said data storage means, said memory array address means including adaptive address means (A within MA 1812), the adaptive address means comprising

means for indicating data storage capacity of said data storage means,

address range indicating means for:

(1) receiving from the memory control means a minimum address which the address range indicating means assigns to the lowest storage location within the corresponding memory array means, and

(2) adding said data storage capacity to said minimum address to produce the address of the highest storage location within the memory array means, and,

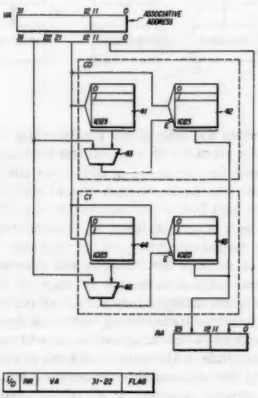
address comparison means for initiating operation of said memory array address means when one of the said second addresses occurs in the range between said lowest storage location within the corresponding memory array means and said highest storage location within the memory array means.

4,513,369

INFORMATION PROCESSING SYSTEM

Fumitaka Sato, Oume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 17, 1982, Ser. No. 349,698
Claims priority, application Japan, Feb. 20, 1981, 56-23166
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **5 Claims**



1. An information processing system including an address

translation system for mapping a plurality of virtual address spaces onto a real address space, comprising:

main memory means for storing information;

main memory controller means for accessing said main memory means with a real address, including translator means for translating a virtual address into said real address;

processing means, connected to said main memory controller means through a common bus, for delivering said virtual address to said main memory means in accessing the main memory means;

said translator means including;

address translation storage means for storing a table having a respective real address corresponding to said virtual address;

translation circuit means, connected to said address translation storage means for accessing said address translation storage means whereby the real address corresponding to said virtual address delivered to said main memory controller means is selected;

address translation buffer means, connected to said translation circuit means and having a plurality of entries, including an entry for storing a translation pair including the virtual address and the real address corresponding to said virtual address stored in said address translation storage means and selected by said translation circuit means; and

address translation buffer management means for replacing the address translation pair currently stored in said entry of said address translation buffer means to the new address translation pair corresponding to virtual address space used for the new access of said main memory means when said address translation buffer management means previously searches said address translation buffer means and said new address translation pair is not found in said address translation buffer means.

4,513,370

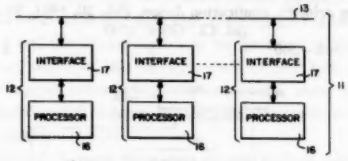
DATA TRANSFER CONTROL SYSTEM AND METHOD FOR A PLURALITY OF LINKED STATIONS

Pinhas Ziv, Supelveda, and Yiu-Keung Ng, Monterey Park, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Jul. 19, 1982, Ser. No. 399,240

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **6 Claims**



1. In a system for selectively transferring data over a data link between a plurality of stations: transmitting means at each of said stations for transmitting data over the data link when enabled, receiving means at each of said stations for receiving data over the data link when enabled, means defining a unique address for each of said stations, an address counter at each of said stations, means operating asynchronously of each other at the respective stations for stepping the address counters in a predetermined sequence, means at each of the stations for enabling the transmitting means at each of the stations to transmit data including a transmitting station address and a receiving station address when the count in the address counter at the station corresponds to the unique address of the station, means responsive to the transmitted transmitting station address for setting the address counters at all of the stations to a count corresponding to the transmitted transmitting station address, means responsive to the receiving station address for enabling the receiving means at the station whose unique address is transmitted to receive the transmitted data, and means for resetting all of the address counters to a predetermined count upon detection of the concurrent presence of signals from the transmitting means at two of the stations on the data link.

4,513,371

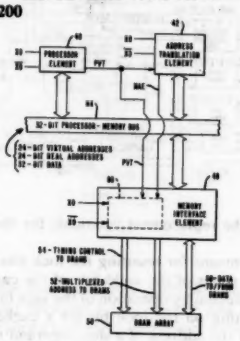
COMPUTER INTERFACE APPARATUS USING SPLIT-CYCLE LOOKAHEAD ADDRESSING FOR FASTER ACCESS TO PAGED MEMORY

John A. Celio, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 29, 1982, Ser. No. 402,883

Int. Cl.³ G06F *9/38, 13/00*

U.S. Cl. 364—200 **1 Claim**



1. In an apparatus for decreasing the access time to addressable memories containing pages of stored data addressable through real addresses, when virtual addressing is used wherein the apparatus uses a memory bus, at least one bank of addressable memory for storing pages of addressable data, a processor means coupled to the memory bus for providing a virtual address consisting of high and low order bits wherein the lower order bits correspond to real address bits and the higher order bits are translatable to real address bits, an address translator means coupled to the memory bus for translating the provided virtual addresses into real addresses and for forwarding the real address to the memory bus, and a memory interface means for interfacing the addressable memory to the memory bus, the improvement in the memory interface means comprising;

first means for receiving and gating said lower order virtual address bits to said addressable memory to commence memory access prior to the completion of translation by said address translator;

second means for receiving and gating the translated higher order bits of said provided virtual address corresponding to the real address from said memory bus to said addressable memory to complete memory addressing;

a decoder operatively coupled to said second means for receiving and converting select higher order address bits into addressable memory bank select signals;

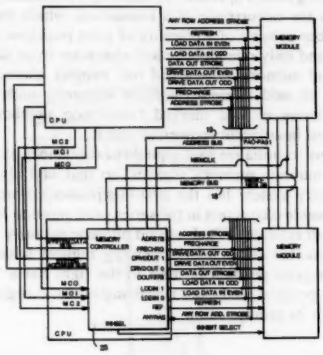
a first logic means responsive to a virtual address on said memory bus for controlling said first and said second means to cause said first and said second means to hold the high and the low order virtual address bits present on said memory bus during a first cycle and to hold the translated virtual address bits present on said memory bus during a second cycle; and

multiplexer means coupled to said first and said second means for receiving and alternately gating to said addressable memory the held low order virtual address bits during said first cycle and the held high order translated address bits during said second cycle.

4,513,372
UNIVERSAL MEMORY

Michael L. Ziegler, Whitinsville; Peter G. Marshall, Northboro, and David L. Whipple, Braintree, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 15, 1982, Ser. No. 441,968
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 10 Claims

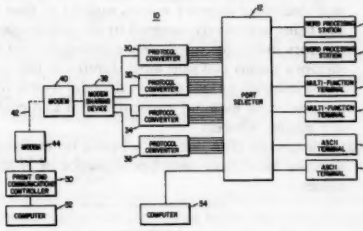


1. A memory device for a computer system,
said computer system including
system data bus; a system address bus;
a central processing unit connected to said system data and system address buses controller means
connected to said system data and system address buses for providing the following signals:
a MEMORY ADDRESS signal indicative of a memory location to be addressed,
a MEMORY DATA signal during a write operation of said memory device,
an ADDRESS STROBE signal,
a LOAD DATA IN EVEN signal during said write operation,
a LOAD DATA IN ODD signal during said write operation,
a DATA OUT STROBE signal during a read operation, of said memory device,
a DATA OUT EVEN signal during said read operation,
a DATA OUT ODD signal during said read operation, and
a PRECHARGE signal,
said memory device being provided with a memory address bus connecting said memory device to said controller, a memory data bus connecting said memory device with said controller, at least one memory module in said memory device and having an array of memory elements arranged nominally in odd and even halfs of rows and columns, means in said memory module responsive to said ADDRESS STROBE signal for latching said MEMORY ADDRESS signal, means in said memory module responsive to the concurrance of said ADDRESS STROBE signal and to module identification portions of said MEMORY ADDRESS signal for generating an ANY ROW ADDRESS STROBE signal for said controller means and for generating a ROW ADDRESS STROBE signal, first delay means responsive to said ROW ADDRESS STROBE signal for successively providing a row address portion of said memory address signal to said memory elements and providing a DELAYED ROW ADDRESS STROBE signal to groups of selected row of said memory elements and then providing a column address portion of said MEMORY ADDRESS signal to said memory elements, whereby both odd and even of said memory elements are addressed, means in said memory device responsive to said LOAD DATA IN EVEN signal for applying data signals on said memory data bus to even memory elements of said memory device, second delay means in each memory module responsive to said LOAD DATA IN EVEN signal for applying a DELAYED WRITE ENABLE signal to said even memory elements of said memory device, thereby enabling said even memory elements to store the DATA signals on said memory data bus, means in said memory device responsive to said LOAD DATA IN ODD signal for applying DATA signals on said memory data bus to odd memory elements of said memory device, third delay means in each memory module responsive to said LOAD DATA IN ODD signal for applying a DELAYED WRITE ENABLE signal to said odd memory elements of said memory device, thereby enabling said odd memory elements to store the DATA signals from said memory data bus, means in said memory device responsive to said DRIVE OUT STROBE signal for latching the outputs of all of the memory elements in the memory device for at least the duration of said DRIVE OUT STROBE signal, means in said memory device response to said DRIVE DATA OUT EVEN signal for enabling the output of the even memory elements of the selected memory module to be placed on the memory data bus, means in said memory device responsive to said DRIVE DATA OUT ODD signal for enabling the output of the odd memory elements of the selected memory module to be placed on the memory data bus, comparison means in each of said modules for determining whether a particular row of that module was accessed during an immediately preceding ADDRESS STROBE signal, means responsive to said comparison means for delaying the ROW ADDRESS STROBE signal until the termination of said PRECHARGE signal, means in said controller means responsive to the absence of the ANY ROW ADDRESS STROBE signal concurrent with the presence of the ADDRESS STROBE and PRECHARGE signals for delaying the transmission of any further signals to the memory device.

4,513,373
LOCAL AREA NETWORK

Duane R. Sheets, Garland, Tex., assignor to Electronic Data Systems Corporation, Dallas, Tex.

Filed Dec. 28, 1982, Ser. No. 454,054
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 5 Claims



1. A local area network, comprising:
a plurality of input/output terminals which transmit and receive data by use of a first communication format,
a multi-port communication switch having a plurality of ports thereof connected respectively to said input/output terminals wherein said switch can connect any one of said terminals to any other of said terminals or to other ports of said switch thereof,
means for converting data between said first communication format and a second communication format, said means

for converting connected to at least one of said ports of said switch,

a computer which transmits and receives data by use of said second communication format, and

means for coupling said means for converting to said computer wherein any one of said input/output terminals can be connected through said switch to communicate with said computer.

4,513,374

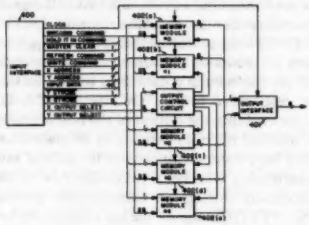
MEMORY SYSTEM

John T. Hooks, Jr., Dallas, Tex., assignor to LTV Aerospace and Defense, Dallas, Tex.

Division of Ser. No. 305,741, Sep. 25, 1981, Pat. No. 4,463,380. This application Nov. 25, 1983, Ser. No. 555,331

Int. Cl.³ G06F *9/06*

U.S. Cl. 364—200 **24 Claims**



1. A relatively high speed memory system comprised of relatively slow speed electronic memory means, said memory system organized as a planar array of rows and columns of word positions and comprising:

(a) address generator means for generating sequences of N addresses to access sequences of N words of data along selected substantially straight paths in any direction across said memory array with each address generated having a set of most significant bits and a set of least significant bits;

(b) a plurality of electronic memory means, each of said memory means having address decoder means responsive to a plurality of address bits for selecting a memory element within said memory means and enable means responsive to an enable signal for enabling said memory means; and

(c) logic means coupling said address generator means to said electronic memory means, said set of least significant bits being selectively coupled to the enable means of said memory means for selectively enabling at least one of said memory means and said most significant bits being selectively coupled to said address decoder means for addressing a selected memory element within said enabled memory means; wherein

(d) N is greater than one and wherein no memory means is selected more than once per sequence of N memory accesses.

4,513,375

TRANSACTION NUMBERING APPARATUS

Robert M. Bruce, 14625 Rayen St., Apt. #110, Panorama City, Calif. 91402

Filed Aug. 18, 1982, Ser. No. 409,114

Int. Cl.³ G06F *15/21*

U.S. Cl. 364—401 **15 Claims**

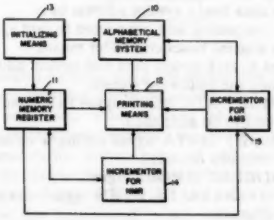
1. A consecutive transaction numbering apparatus comprising:

a. an alphabetical memory system having operable accessibility to a predetermined number of unique alphabetical characters in alphabetically retrievable order, and having a print position for only one of said alphabetical characters at a time;

b. at least one or more numeric memory registers, each of said numeric memory registers having operable accessibility to number characters representative of all ten arabic numerals arranged in numerically retrievable order, and having a print position for only one of said number characters at a time;

c. marking means operable for marking a transaction number upon the occurrence of a transaction which transaction number consists of a plurality of print positions including one and only one alphabetical character from said alphabetical memory system and one number character from each of said numeric memory registers, such that the characters of said marked transaction number are arranged in adjacent sequential order;

d. means to initialize said alphabetical memory system and said numeric memory registers so that said alphabetical memory system has the first-in-alphabetical-order of its accessible characters in the series print position farthest to the left relative to each of said numeric memory registers, and so that said numeric memory register which is in a series print position farthest to the right has a "1" in its print position, and each remaining numeric register has a "0" in its print position;



e. means to increment said numeric memory registers after each transaction number is marked by advancing, as a group, the numeric characters in the print position by one, and when all numeric characters in the print position are "9" and when said alphabetical memory system is not in the series print position farthest to the right, by advancing all numeric characters in the print position to "0" and interchanging the series print position of the alphabetical memory system with the series print position of the numeric memory register immediately to the right of the series print position of said alphabetical memory system; and

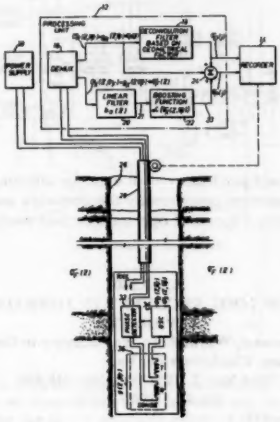
f. means to increment said alphabetical memory system when said alphabetical memory system is in the series print position farthest to the right relative to the series print position of each numeric memory register, and said numeric character in the print position of each numeric memory register is "9", after such transaction number has been marked and to reposition the series print position of said alphabetical memory system by shifting it to the farthest series print position to the left, and to shift the series print position of each numeric memory register one series print position to the right of its former series print position, and to advance all numeric characters in print position in each numeric memory register to "0".

4,513,376

PHASOR PROCESSING OF INDUCTION LOGS INCLUDING SKIN EFFECT CORRECTION

Thomas D. Barber, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jan. 12, 1982, Ser. No. 339,006
Int. Cl.[3] G01V 3/18, 3/38
U.S. Cl. 364—422 14 Claims



1. A method of processing induction measurements of subsurface formations taken by an induction logging system at various depths in a borehole in the earth, the logging system having a spatial domain sonde response function with real and imaginary components which vary with the conductivity of the sub-surface formations being investigated, said method reducing both the unwanted contributions in each measurement from formation currents flowing in formations spaced apart from each measurement depth and the effects of variations in the sonde response function with formation conductivity, each log measurement consists of an in-phase and a quadrature-phase component where the real component of the sonde response function transforms the formation conductivity distribution into the in-phase components and the imaginary component of the sonde response function transforms the formation conductivity distribution into the quadrature-phase components, said method comprising the steps of:

(a) deconvolving the in-phase log measurements based on the real component of the sonde response function obtained at zero conductivity to obtain shoulder effect corrected log measurements;

(b) filtering the quadrature-phase component measurements according to a predetermined non-linear spatial filtering function to obtain correction component measurements representative of the change in the sonde response function as a function of formation conductivity; and

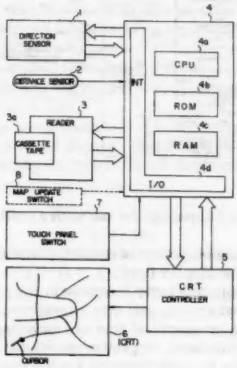
(c) summing the processed in-phase and correction component measurements to obtain the processed log measurements in which the unwanted contributions in each in-phase measurement to formation currents flowing in distant formations about each measurement point and the effects of variations in the sonde response function to variations in the conductivity of the formation being measured are reduced.

4,513,377

VEHICLE-MOUNTED NAVIGATOR

Koshi Hasebe, Anjo, Japan; Kunio Miura, Okazaki; Takashi Ono, Kariya; Kazushi Akutsu, Kariya, and Kazuaki Minami, Kariya, all of, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 8, 1982, Ser. No. 386,267
Claims priority, application Japan, Jun. 11, 1981, 56-90626; Jun. 15, 1981, 56-91949
Int. Cl.[3] G06F 15/50; G09B 29/10
U.S. Cl. 364—449 10 Claims



1. A vehicle-mounted navigator comprising:

distance sensor means for detecting the running distance of the vehicle;

direction sensor means for detecting the travelling direction of the vehicle;

calculation means responsive to detection signals from said distance sensor means and said direction sensor means for calculating a present position of the vehicle;

memory means for storing map data including a plurality of road maps corresponding to the vehicle's travelling regions;

display means for electronically displaying a road map corresponding to one of said plurality of travelling regions on a display surface thereof;

present position display control means for allowing said display means to display the present position of the vehicle calculated by said calculation means on the road map displayed on the display surface thereof;

decision means for deciding whether the present position of the vehicle displayed on said display surface exists in one of a plurality of adjacent regions located in the periphery of said display surface;

road map display control means for reading the map data of the adjacent region corresponding to the decided adjacent region from said memory means and for allowing said display means to display the road map of the adjacent region adjacent to the presently displayed vehicle travelling region instead of the display of the present road map, when said decision means decides that the displayed present position exists in one of said adjacent regions; and

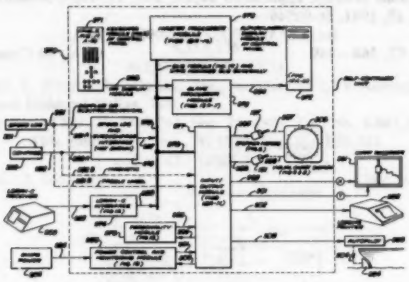
correction means for automatically correcting said displayed present position in accordance with the positional relation between the presently displayed region and the adjacent region which is to be displayed, when said road map display control means changes the display of the presently displayed road map to the adjacent region.

4,513,378

HIGH-ACCURACY NAVIGATING APPARATUS WITH STEP-DRIVEN PROJECTED CHART

Edward T. Antkowiak, Harbour Hill, York, Me. 03909

Filed Oct. 20, 1981, Ser. No. 313,233
Int. Cl.³ G01S *7/10, 7/46;* G06F *15/50*
U.S. Cl. 364—450 **11 Claims**



1. A navigational apparatus for use with a craft, said apparatus comprising:

an optical projection system having an optical path terminating in a visible display field;

an optically projectable map locatable in the optical path of said projection system, said map providing a scaled representation of a geographical area and including at least two calibration indicia at respective positions on said map corresponding to predetermined known coordinates,

map transport means for controllably effecting relative movement between said map and said projection system in accordance with applied transport control signals;

map calibration means for for moving said calibration indicia to a predetermined position within said projection system and for then coordinating said known coordinates with the position of the map transport means to derive calibration data used in thereafter generating transport control signals; and

transport drive means for generating said transport control signals in accordance with said calibration data and in accordance with supplied craft position data to vary said map position relative to said projection means in accordance with the geographic position of said craft.

4,513,379

CUSTOMIZATION WINDOW FOR A COMPUTER NUMERICAL CONTROL SYSTEM

William P. Wilson; Catherine M. Hewlett, and Werner P. Rieben, all of Charlottesville, Va., assignors to General Electric Company, Charlottesville, Va.

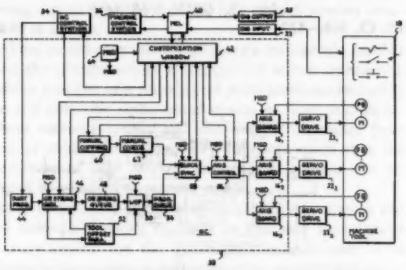
Filed Sep. 7, 1982, Ser. No. 415,041
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **23 Claims**

9. The method for controlling the operation of a computer numerical control system for controlling the operation of a machine tool in the performance of specified operations with respect to a workpiece, comprising the steps of:

(a) executing a series of routines stored in a memory of a digital computer and controlling thereby plural axis motions of said machine tool, said routines being defined as the numerical control;

(b) executing a series of routines stored in the memory of said digital computer and controlling thereby auxiliary functions of said machine tool, said routines being defined as the machine control logic; and

(c) executing a series of routines stored in the memory of said digital computer and generating a plurality of status flags for implementing a customization window interface between said machine control logic and said numerical control, said machine control logic thereby accessing and controlling the numerical control under predetermined conditions, said numerical control returning said status



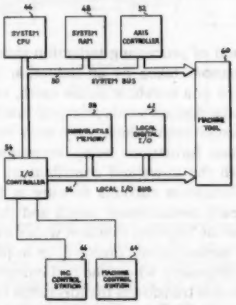
flags to said machine control logic for effecting a coordinated operation concurrently therebetween and performing thereby a specified operation on said workpiece.

4,513,380

METHOD OF TOOL RECOVERY IN THREADCUTTING APPARATUS

Jerrold C. Spooner, Waynesboro, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Sep. 7, 1982, Ser. No. 415,508
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **2 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 32 Pages)



1. A method for interrupting a machine operation in a computer numerical control (CNC) system in which the CNC is programmed to position a cutting tool with respect to a workpiece such that relative motion between the tool and workpiece wil allow the workpiece to be machined to a desired configuration, the program defining a start point for the machining operation, the CNC system including input means for receiving an interrupt command, said method comprising in response to an interrupt command, the steps of:

(a) determining whether the system is operating in a threadcutting mode;

(b) providing, if in a threadcutting mode, a first command to cause the cutting tool to pull out from the workpiece while continuing motion in the direction of threadcutting;

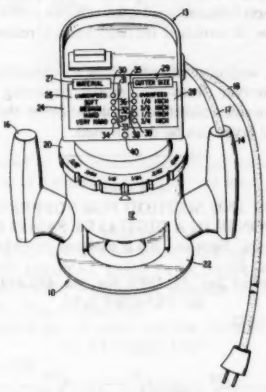
(c) providing, if not in a threadcutting mode, an abort command to terminate all machining operations; and

(d) generating a pull-out command to cause the tool to exit the workpiece.

4,513,381
SPEED REGULATOR FOR POWER TOOL

John Houser, Jr., Pickens, S.C., and Thomas C. Laughon, Alpharetta, Ga., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 7, 1982, Ser. No. 385,631
Int. Cl.[3] H02P 1/22, 7/28
U.S. Cl. 364—475 8 Claims



1. A power tool for operating on a work material in which the feeding rate between the work material and the power tool is imposed by the direct muscular effort of an operator, said power tool having a frame supporting a motor, and a cutting implement driven by said motor, said power tool comprising:

(a) selecting means for selecting a work material to be operated upon;

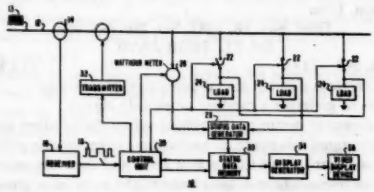
(b) regulating means including memory means supported in said frame and responsive to a selected material for regulating speed of said motor to an optimum speed for said selected material from a first table of a first speed for various materials stored in said memory; and,

(c) responding means including said regulating means for responding to an operator imposed feed condition in which the loading imposed by the operator exceeds a preferred loading for operation of said power tool at said first speed, by increasing the speed of said cutting implement according to a second table of optimum speeds for various materials at various loadings stored in said memory of said regulating means.

4,513,382
ELECTRIC UTILITY AUTOMATED DISTRIBUTION APPARATUS WITH IMPROVED DATA DISPLAY

James V. Faulkner, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1982, Ser. No. 408,957
Int. Cl.[3] H04B 7/00, 3/54; H04Q 9/00
U.S. Cl. 364—492 17 Claims



1. Remote terminal apparatus for use in an electric utility power line communications system for carrying control commands relating to the transmission and consumption of electric energy from a central station to a remote location, said apparatus comprising:

receiving means at said remote location for deriving said control means;

control means connected to said receiving means for executing control functions in response to said control commands;

means connected to said control means for generating data representative of the status of said receiving means location;

memory means connected to said status data generating means for storing said status data in a digital form;

a display generator for generating a composite video signal corresponding to an alphanumeric representation of digital signals applied to an input thereof;

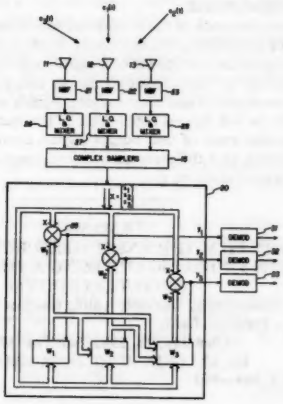
means for coupling the input of said display generator to said memory means; and

video display means coupled to said display generator for providing a visual display of said alphanumeric representation, whereby said status data is displayed to an operator at said receiving means location.

4,513,383
SEPARATION OF COMMUNICATION SIGNALS IN AN ADAPTIVE ANTENNA ARRAY

Charles M. Hackett, Jr., Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1981, Ser. No. 305,296
Int. Cl.[3] G06F 15/20; G01S 3/46
U.S. Cl. 364—517 11 Claims



1. A method for separating m radio frequency signals incident on an array n antenna elements, wherein there is, for each element, a time-varying signal from the element and a corresponding input signal capable of being processed by the method, which input signal is generated from the time-varying signal and can be representative of its complex envelope, said method comprising:

computing the weighted combination of the input signals for each set of weights in an ordered sequence of sets of weights, from a first set through an n-th set, with each of the resulting n computed combinations providing an output signal, designated with an index i as y_i, and associated with the i-th set of weights;

forming, for each one of the n output signals, a set of products of the one output signal and the complex conjugates of the input signals, and time smoothing each of said sets of products;

for each of the n sets of smoothed products, modifying the i-th set of smoothed products associated with the i-th output signal, in response to all of the sets of weights which precede the i-th set of weights in said sequence; and

for each of the n modified sets of smoothed products, normalizing the modified i-th set of smoothed products to provide the i-th set of weights, approaching that eigenvector of the cross-correlation matrix of the complex envelopes of said time-varying signals which corresponds to the -th largest eigenvalue of the matrix,

whereby each of said output signals corresponds predominately to a different one of said incident radio frequency signals for m less than or equal to n.

10. An apparatus for separating m radio frequency signals incident on an array of n antenna elements, wherein there is, for each element, a time-varying signal derived from the element and a corresponding input signal capable of being processed by the apparatus, which input signal is generated from the time-varying signal and can be representative of its complex envelope, said apparatus comprising:

means for computing the weighted combination of the input signals for each set of weights in an ordered sequence of sets of weights, from a first set through an n-th set, with each of the resulting n computed combinations providing an output signal, designated with an index i as y_i, and associated with the i-th set of weights;

means for forming, for each one of the n output signals, a set of products of the one output signal and the complex conjugates of the input signals, and time smoothing each of said sets of products;

means, for each of the n sets of smoothed products, for modifying the i-th set of smoothed products associated with the i-th output signal, in response to all of the sets of weigths which precede the i-th set of weights in said sequence; and

means, for each of the n modified sets of smoothed products, for normalizing the modified i-th set of smoothed products to provide the i-th set of weights, approaching that eigenvector of the cross-correlation matrix of the complex envelopes of said time-varying signals which corresponds to the i-th largest eigenvalue of the matrix,

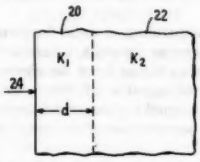
whereby each of said output signals corresponds predominantly to a different one of said input signals for m less than or equal to n.

4,513,384

THIN FILM THICKNESS MEASUREMENTS AND DEPTH PROFILING UTILIZING A THERMAL WAVE DETECTION SYSTEM

Allan Rosencwaig, Danville, Calif., assignor to Therma-Wave, Inc., Fremont, Calif.

Filed Jun. 18, 1982, Ser. No. 389,623
Int. Cl.³ G01N *25/00, 29/04;* G06F *15/00*
U.S. Cl. 364—563 **12 Claims**



1. A method for determining the thickness of at least one layer of material deposited on a substrate by measuring the value of either the phase or magnitude parameters of thermal wave signals generated by a focused periodic heat source comprising the steps of:

deriving a model that provides expressions for the temperature at and beneath the surface of a known reference sample and for the thermoelastic response beneath the surface of the known reference sample;

focusing said periodic heat source on the uppermost layer deposited on said substrate;

measuring the value of one of said parameters of the thermal wave signals at a plurality of selected modulation frequencies of said heat source wherein the number of modulation frequencies selected is greater than the number of layers whose thickness is to be determined;

normalizing the measured value of said parameter of each modulation frequency selected relative to the value of said parameter determined for said known reference sample; and

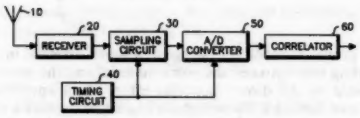
comparing said normalized values to expected normalized values derived from said model depicting the thermal process in said reference sample whereby the thickness of each said layer can be determined.

4,513,385

APPARATUS AND METHOD FOR SUPPRESSING SIDE LOBE RESPONSE IN A DIGITALLY SAMPLED SYSTEM

David L. Muri, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1983, Ser. No. 462,494
Int. Cl.³ G06F *3/05*
U.S. Cl. 364—572 **59 Claims**



55. A method of providing a computer with processing time for performing other tasks when said computer is functioning as a correlator for correlating a sampled signal with a predetermined pattern to determine the presence of a predetermined frequency, said method comprising the steps of:

sampling a first signal to produce samples thereof including a first sample during a first time segment of a predetermined observation window;

interrupting said sampling for a second time segment of said predetermined observation window to enable said computer to perform said other task thereby effectively ignoring said first signal during said second time segment;

sampling said first signal for the remainder of said predetermined observation window to produce samples thereof including a last sample; and

correlating said samples with said predetermined pattern to determine the presence of said predetermined frequency for a first time segment of said observation window.

4,513,386

RANDOM BINARY BIT SIGNAL GENERATOR

Sydney Glazer, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 18, 1982, Ser. No. 442,709
Int. Cl.³ H03B *29/00*
U.S. Cl. 364—717 **12 Claims**

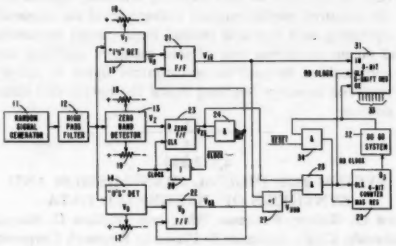
1. A random number signal generator comprising:

means to generate a random amplitude signal;

first detector means to determine when the random amplitude signal has made an excursion farther in one polarity from a zero value than a first level and then has returned to an intermediate range closer to the zero value than the first level to generate a signal having a first binary value; and

second detector means to determine when the random am-

plitude signal has made an excursion farther in the opposite polarity from the zero value than a second level and



has returned to the intermediate range to complete the generation of a signal having a second binary value.

4,513,387

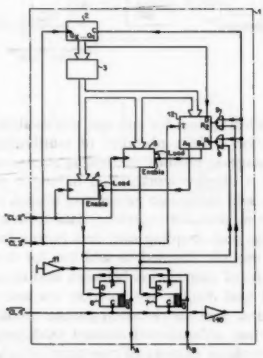
METHOD AND AN APPARATUS FOR GENERATING PERIODIC DIGITAL TIME FUNCTION SIGNALS

Norbert Neyer, Zürich, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jul. 13, 1982, Ser. No. 397,825

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—718 **13 Claims**



1. In a method of obtaining digital periodic time function signals with the aid of a memory (3) having a plurality of storage cells, each time function signal having a first period (T), predetermined binary numbers stored in corresponding storage cells defining each periodic time function signal,

the steps comprising

for each of said digital periodic time function signals calculating a first group of binary numbers (x_j) representing relative time values of their positive and negative going edges by choosing for each of said relative time values an own zero reference point by taking into account the delay time of said memory (3), by using a second period (T_2) as a time unit,

allotting to said binary numbers (x_j) a predetermined, normally not used binary number (255="11111111"), in each case an edge is not to be produced,

assigning a prearranged number of said storage cells to each of said digital periodic time function signals to be obtained,

storing each one of said first groups of binary numbers (x_j) in those of said storage cells which belong to said digital periodic time function signal, and in such an order of succession that increasing absolute time values related to said binary numbers (x_j) correspond to increasing values of memory addresses, whereby said absolute time values correspond to said relative time values with the difference that the absolute time values have a single zero reference point common for all of them,

generating a first clock signal (CL1) for resetting purposes, having a period (T_1) equal to said first period (T) of said digital periodic time function signals,

generating a second clock signal (CL2) having said second period (T_2), which has a predetermined relationship to said first period (T),

deriving from said second clock signal (CL2) a third clock signal (CL3), having a third period (T_3) which is a multiple of said second period (T_2),

binary counting the number of said third periods (T_3) with the aid of an address counter (2) and allotting this second group of binary numbers to said memory addresses of said storage cells,

successive calling up said different storage cells belonging to said digital periodic time function signal, with the aid of said second group of binary numbers and the address inputs of said memory (3), and thereby successively reading of said binary numbers (x_j) of said first group of binary numbers out of said memory (3),

successive parallel loading said binary numbers (x_j) of said first group of binary numbers in period counters (4; 5),

delayed enabling between each of said loadings during an enabling time interval, only the counting of one of said period counters (4; 5) with the aid of a logic circuit (12), if an edge of said digital periodic time function signal which belongs to said one period counter must be produced during said enabling time interval,

counting the number of second periods (T_2) during said enabling time beginning with said loaded binary number (x_j) of said first group of binary numbers until a predetermined reference number is reached,

in the moment of reaching said predetermined reference number, inverting the digital instantaneous value of said digital periodic time function signal at the output of a D-flip-flop (6; 7) with the aid of this D-flip-flop.

4,513,388

ELECTRONIC DEVICE FOR THE EXECUTION OF A MATHEMATICAL OPERATION ON SETS OF THREE DIGITAL VARIABLES

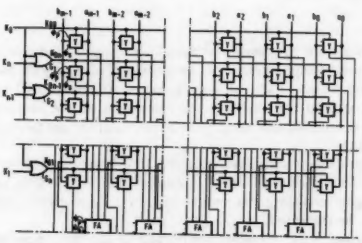
Hendrikus J. M. Veendrick; Leonardus C. M. G. Pfennings; Johannes G. Raven, and Antonius H. H. J. Nillesen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 305,423, Sep. 25, 1981, abandoned. This application Apr. 16, 1984, Ser. No. 601,093

Claims priority, application Netherlands, Oct. 6, 1980, 8005506

Int. Cl.³ G06F *7/38*

U.S. Cl. 364—736 **15 Claims**



1. An electronic device for executing on three digital variables (A, B, K) a mathematical operation of the kind $K A+(1-K) B$, said electronic device comprising:

first and second input means for receiving a first (A) and a second (B) m-bits ($m \geq 0$) input signals representing two of said three digital variables, and third input means for receiving an $(n+1)$-bits ($n>0$) weighting factor signal K representing the third digital variable;

at least n logic gates, an i^{th} logic gate (G_i) ($1 \leq i \leq n$) having a first input for receiving the i^{th} bit coefficient value (K_i) of said weighting factor signal, each of said logic gates being a second input for receiving the zero order bit coefficient value (K_{00}) of said weighting factor signal, said i^{th} logic gate (G_i) being provided for generating and presenting at an output thereof a weighting signal $K_{0i}=K_i \vee K_{00}$, (where V stands for the mathematical "OR");

$(n+1)$ x m electronic circuits (Y) which are arranged as the elements of an $(n+1)$ by m matrix, a matrix element Y_{ij} of the j'^{th} column ($1 \leq j' \leq m$) and the i'^{th} row ($2 \leq i' \leq n+1$) (or vice versa) having a first and a second input for receiving the j^{th} (a_j and b_j, $0 \leq j \leq m-1$) bit coefficient values of said first and said second input signals, and a third input connected to the output of a respective logic gate for receiving said weighting signal K_{0i} ($i=i'-1$), the matrix elements of a first row ($i'=1$) having a third input for receiving the zero order bit coefficient (K_{00}) of said weighting factor signal, each of said electronic circuits being provided for generating a partial output signal by executing the mathematical operation $Y_{ij}=K_{0i'} \cdot [aj+(1-K_{0i'})bj]$ ($o \leq i'' \leq n$) on the bit coefficient values presented at its inputs, each of said electronic circuits having an output for supplying said partial output signal, the outputs of said electronic circuits are connected to inputs of full adders which serve to sum all said partial output signal and for generating a digital output signal of the value $Z=KA+(1-K)B$; and

an output means for supplying said digital output signal.

4,513,389

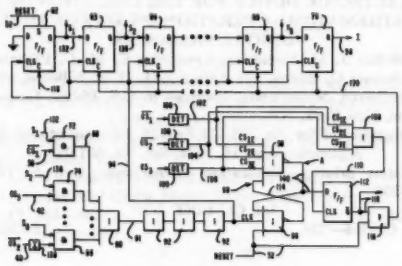
ROM SECURITY CIRCUIT

Rathindra N. Devchoudhury, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 12, 1981, Ser. No. 320,790

Int. Cl.³ G06F *13/00, 7/00*

U.S. Cl. 364—900 **15 Claims**



1. In a data processing system including a memory device and a processing device for outputting a plurality of memory enabling signals each of which has a predetermined voltage level required for enabling the operation of the memory device, a circuit for initiating the operation of the memory device including:

a plurality of serially-connected first logic circuit members each of which, when operated, outputs a first control signal enabling the succeeding first logic circuit member to be operated;

a second logic member connected to the last operated first logic circuit member and enabled upon receiving said first control signal for outputting a second control signal when operated;

first logic circuit means connected to each of said first logic circuit members for receiving said memory enabling signals and said first control signal for outputting a third control signal to said first and second logic circuit members in response to said memory enabling signals having the required predetermined voltage level for sequentially operating said first and second logic circuit members;

and means receiving one of said memory enabling signals and enabled by said second control signal to allow the received memory enabling signal to operate said memory device.

4,513,390

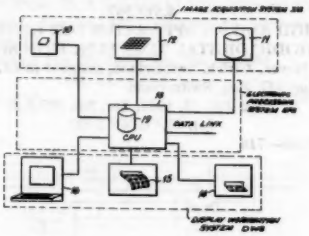
SYSTEM FOR DIGITAL TRANSMISSION AND SYNTHESIS OF INTEGRATED DATA

Gerard O. Walter, Potomac, Md., and William D. Sheppard, Lakeside, Calif., assignors to Planning Research Corporation, McClean, Va.

Continuation of Ser. No. 37,228, Jun. 8, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 321,540

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—900 **15 Claims**



1. An information system for storage, retrieval, and generation of information from a plurality of multimedia sources, comprising an image-acquisition system, an electronic processing system, and a display workstation having a plurality of output modules, said electronic processing system including a serial input port module for receiving data from said image-acquisition system and coupling said data onto a local system bus, a program module coupled to said bus for directing the sequence and flow of information between said image-acquisition system and said display workstation via said electronic processing system, said workstation output modules being coupled to said bus, a functional control module coupled to said bus for controlling priority of operation of said workstation output modules coupled to said bus whereby said control module handles bus contention problems, a redundancy reduction module coupled to said bus for controlling the digital data rate of transfer of data through said bus, and a plurality of output port modules coupled to said bus for accessing various additional output modules including memory and communication modules.

4,513,391

TEXT PROCESSING APPARATUS WITH TWO-STAGE FORMATTING OF TEXT

Robert F. Maddock, Southampton, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1982, Ser. No. 360,093

Claims priority, application European Pat. Off., Apr. 8, 1981, 81301527.8

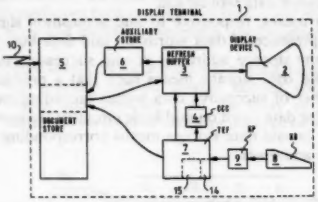
Int. Cl.³ G06F *15/00*

U.S. Cl. 364—900 **2 Claims**

1. Apparatus for editing and formatting text stored in a refresh buffer and display on a display device as lines, said apparatus comprising;

(a) logic means for causing said text to be edited in response to keystroke signals received from a keyboard, and in

absence of keystroke signals, for reformatting said edited text according to formatting requirements for said text; and



(b) means included in said logic means for (1) delaying editing of said text in response to said keystroke signals if overflow of a line being edited will result from said editing, and (2) reformatting said line being edited in order to avoid overflow during subsequent editing.

4,513,392

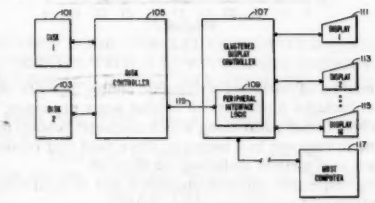
METHOD AND APPARATUS FOR GENERATING A REPETITIVE SERIAL PATTERN USING A RECIRCULATING SHIFT REGISTER

William H. Shenk, Acton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 25, 1982, Ser. No. 381,999

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—900 **12 Claims**



1. The method of generating a repetitive serial pattern using a recirculating shift register to reduce the amount of memory that would otherwise be required to hold a complete data pattern, said method comprising the steps of:

a. initializing the memory to contain a subset of the complete data pattern to be serialized;

b. reading a unit of data from the memory;

c. loading the unit of data into a parallel to serial shift register;

d. performing a parallel to serial conversion of the unit of data by shifting the unit of data in the shift register one bit at a time under the control of a bit clocking signal until all bits in the unit of data have been shifted out of a serial output of the parallel to serial shift register;

e. returning to step b and reading the next unit of data from the memory under the control of a unit clocking signal until the last unit of data is read from the memory;

f. detecting when the last unit of data is read from the memory and inhibiting the further loading of a unit of data from the memory into the parallel to serial shift register; and

g. recirculating the last unit of data in the parallel to serial shift register by connecting the serial output to a serial input of the shift register, and continuing to recirculate the last unit of data and shifting out bits under control of the bit clocking signal until no more bits of data are required as determined by a count of the number of units of data output by the parallel to serial shift register.

4,513,393

DOCUMENT HANDLING TERMINAL COMPUTER

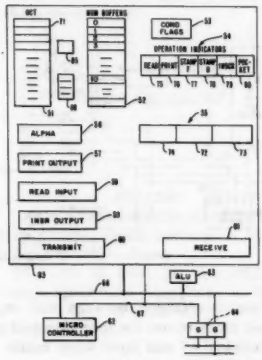
Olof A. Edlund; Mats A. Ensér, both of Lidingo; Jan W. Strage, Sollentuna; Svante B. Thunberg, and Erik I. Wallmark, both of Lidingo, all of Sweden, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,669

Claims priority, application European Pat. Off., Jun. 11, 1981, 81850108.2

Int. Cl.³ G06F *3/04, 15/30*

U.S. Cl. 364—900 **4 Claims**



1. A computer terminal for connection to a host computer, said terminal including a plurality of input/output devices, an information storage comprising a buffer area and an input/output area, and a terminal processor for controlling operation of said terminal wherein, the improvement comprises:

an operation table in said information storage, said table including a list of instructions loaded into said table from said host computer, each of said instructions having a condition field, said instructions being sequentially accessed and selectively executed by said terminal processor for controlling the operation of said input/output devices;

a condition register in said information storage for storing condition flags to be compared by said terminal processor with condition flags in said condition field of said instructions before an operation specified by an operation code in said instructions is allowed to be executed by said terminal processor;

a plurality of operation indicators stored in said information storage, each operation indicator settable by said terminal processor as said operation code of a corresponding one of said instructions is executed, said operation indicators controlling data transfer between said input/output area and said plurality of input/output devices by said terminal processor asynchronously with execution of said instructions in said operation table.

4,513,394

SYSTEM FOR PROVIDING A MULTI-BIT INPUT TO A COMPUTER CONTROLLED SYSTEM

Craig E. Deyer, Akron, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,545

Int. Cl.³ G06F *3/02*

U.S. Cl. 364—900 **10 Claims**

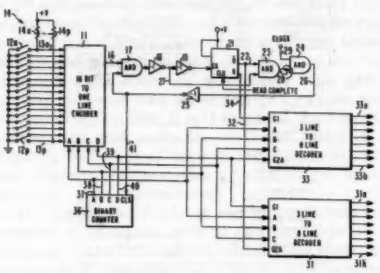
1. A system for providing a multi-bit input to a computer in response to the change of state of one of a plurality of system input lines comprising:

input logic means having a plurality of input terminals, a plurality of binary number terminals and at least one output terminal;

a plurality of means for changing the state of said input terminals, each of said input terminals being responsive to one of said means for changing state whereby a change of state on one of said input terminals sets and input position number into said logic means;

binary input means for providing binary inputs to said binary number terminals whereby said input logic means produces an output on said output terminal when said binary input equals said input position number;

clock means for providing clock pulses to said binary input means;



bistable logic means arranged between said input logic means and said clock means for receiving said output on said output terminal of said input logic means whereby said bistable logic means controls said clock means, said bistable logic means being responsively coupled to a read-complete signal from said computer; and

output logic means responsive to said binary input means and controlled by said bistable logic means for decoding said binary inputs into said input position number whereby said multi-bit input is provided to said computer when via said output logic means said binary input equals said input position number.

4,513,395

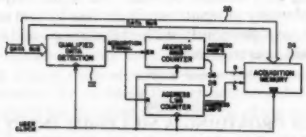
APPARATUS AND METHOD FOR ACQUIRING MULTIPLE GROUPS OF DATA SIGNALS FROM A SYNCHRONOUS LOGIC SYSTEM

Michael D. Henry, Portland; Bruce J. Ableidinger, Beaverton, and Nirmal K. Agarwal, Portland, all of Oreg., assignors to Northwest Instrument Systems, Inc., Beaverton, Oreg.

Filed Mar. 25, 1983, Ser. No. 479,089

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—900 **16 Claims**



1. An apparatus for acquiring data words which are present on synchronous logic circuitry of a system under test, comprising:

(a) detecting means coupled to said data bus for producing an acquisition signal indicative of the occurrence of at least one particular data word on said logic circuitry;

(b) data storage means having a plurality of storage locations and addresses corresponding with said locations, said data storage means coupled to said data bus for storing a plurality of successive data words; and

(c) addressing means, responsive to said acquisition signal and to the presence of data words on said data bus, for producing the storage addresses of said successive data words in said data storage means such that a predetermined number of successive data words preceding each said particular data word on said logic circuitry are stored in locations in said data storage means corresponding to said storage addresses.

4,513,396

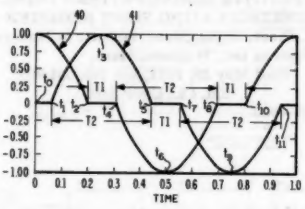
METHOD OF OPERATING A MAGNETIC BUBBLE MEMORY WITH A DRIVE FIELD THAT TEMPORARILY STOPS

Sidney J. Schwartz, deceased, late of Vista, Calif. (by Marie A. Schwartz, legal representative), assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 29, 1983, Ser. No. 508,947

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—6 **10 Claims**



1. A method of operating a magnetic bubble memory of the type that includes a plurality of spaced apart propagate elements which define paths along which magnetic bubbles move in a plane in response to a magnetic drive field that rotates in said plane; said method including the steps of:

sending respective currents through a pair of field coils to produce said rotating magnetic fields;

generating at least one of said currents to consist of a series of positive and negative going waveforms separated by a dwell period so that the rotation of said field temporarily stops during said dwell period;

timing said dwell period to occur when said bubbles cross the spaces between said propagate elements;

increasing the magnitude of said field, while it is temporarily stopped, substantially over the largest magnitude which the field has when it is rotating; and

moving said bubbles across the spaces between said propagate elements by means of said temporarily stopped field with its substantially increased magnitude without the aid of any other separately generated field.

4,513,397

ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

Alfred C. Ipri, Princeton, and Roger G. Stewart, Neshanic Station, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 10, 1982, Ser. No. 448,690

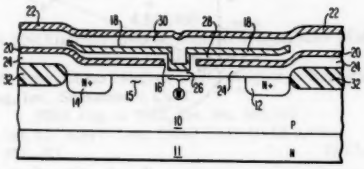
Int. Cl.³ G11C *11/40*

U.S. Cl. 365—185 **10 Claims**

1. In a floating gate memory device including a body of semiconductor material of a first conductivity type having first and second doped regions of a second conductivity type

formed in the semiconductor body at the surface thereof, the first and second doped regions spaced one from the other to define a channel region therebetween in the semiconductor body for supporting current flow between the doped regions, a first level conductive layer insulated from the body of the semiconductor material and a second level conductive layer positioned over both the channel region and the first conductive layer and insulated therefrom, the improvement comprising:

the first level conductive layer is a word line having a charging window formed therein aligned with the channel region and insulated from the body of semiconductor material by a layer of insulator material of a first thickness;



the second level conductive layer is a floating gate having a portion that extends through the charging window for coupling to the channel region and having a remaining portion that extends over the word line;

the portion of the floating gate that extends into the charging window is insulated from the channel region by a layer of insulator material of a second thickness; and

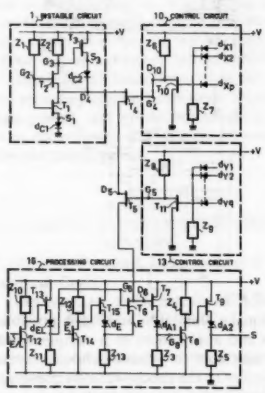
the portion of the floating gate that extends over the word line is insulated from the word line by a layer of insulator material of a third thickness that is thicker than the second thickness and thinner than the first thickness.

4,513,398

BISTABLE LOGIC CIRCUIT USING FIELD EFFECT TRANSISTORS WITH A LOW VOLTAGE THRESHOLD AND STORAGE DEVICE INCORPORATING SUCH A CIRCUIT

Tung Pham Ngu, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 16, 1982, Ser. No. 408,278
Claims priority, application France, Aug. 21, 1981, 81 16114
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **14 Claims**



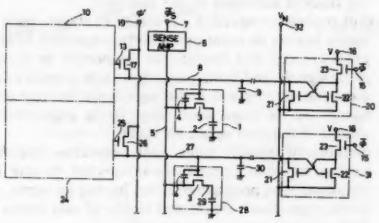
1. A bistable logic circuit using field effect transistors with a low threshold voltage connected between first and second terminals of a supply voltage generator, comprising first, second and third field effect transistors, said first and second field effect transistors being in series with their gates interconnected and connected to the first terminal of the supply voltage generator by a first load, the source of the first field effect transistor being connected to the second terminal of the supply voltage generator, the drain of the first field effect transistor being connected to the source of the second field effect transistor, the drain of the second field effect transistor being connected on the one hand to the first terminal of the supply voltage generator by a second load and on the other hand to the gate of the third field effect transistor, whose drain is connected to the first terminal of the supply voltage generator and whose source is connected via a Schottky diode to the common point constituted by the drain of the first transistor and by the source of the second transistor, said common point constituting the output terminal of the bistable circuit.

4,513,399

SEMICONDUCTOR MEMORY

Youichi Tobita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 468,879
Claims priority, application Japan, Mar. 4, 1982, 57-35361
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **6 Claims**



1. A semiconductor memory comprising

a plurality of memory cells, each comprising a switching transistor having first and second main electrodes and a gate electrode, and storage capacitance connected to the first main electrode of said switching transistor,

a bit line connected to the second main electrode of said switching transistor for transmitting the data stored in said storage capacitance,

a clock source for generating a clock signal for controlling ON/OFF states of said switching transistors,

word lines connected to the gate of said switching transistor for transmitting said clock signal,

a decoder circuit for selecting a word line out of said word lines to apply said clock signal to the gate of corresponding said switching transistor,

a voltage source for generating a voltage lower than the level of a logical "0" of the data to be transmitted through said bit line,

word line pull-down circuits each including a pull-down transistor having a first main electrode connected to said corresponding word line and a second main electrode connected to said voltage source, and

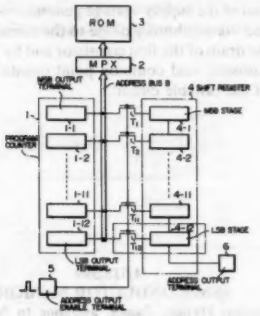
controlling signal supplying means for supplying to a gate of said pull-down transistor a controlling signal for controlling the impedance state of the pull-down transistor.

4,513,400

CIRCUIT FOR READING OUT ADDRESS DATA APPLIED TO A MEMORY IN A ONE-CHIP MICROCOMPUTER

Satoru Masaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 22, 1982, Ser. No. 390,875
Claims priority, application Japan, Jun. 25, 1981, 56-97396
Int. Cl.³ G06F *1/00*; G11C *19/28*
U.S. Cl. 365—230 **7 Claims**



1. A circuit operatively connected to receive clock signals and operatively connected to a memory in a one-chip microcomputer, for reading out address data to the outside, comprising:

a program counter having a plurality of outputs for specifying readout addresses of the memory;

a shift register comprising a plurality of stages, each of said stages having an input operatively connected to said program counter and operatively connected to receive the clock signals, and having an output, said plurality of stages comprise the stages of a least significant bit stage to a most signifi ant bit stage, each stage being sequentially connected to the next upper bit stage;

a plurality of transfer gates, each respective transfer gate having an input operatively connected to one of said outputs of said program counter, having an ouput, respectively, operatively connected to one of said inputs of said shift register, and having a gate;

an address output enable terminal, operatively connected to said transfer gates, for receiving an address output enable signal, said outputs of said program counter being transferred through said transfer gates to said shift register when said address output enable signal is applied to said address output enable terminal; and

an address output terminal, operatively connected to one of said outputs of said shift register, for outputting the contents stored in said shift register.

4,513,401

MARINE CABLE LOCATION SYSTEM

Henning Ottsen, and Thruburn Barker, both of Ventura, Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 16, 1982, Ser. No. 358,755
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—19 **5 Claims**

1. A method for locating a marine cable at a seismic marine exploration site, comprising the steps of:

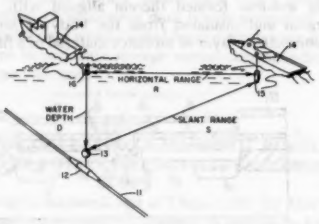
(a) traversing at least one path parallel to and offset horizontally from an estimated location for said cable with a vessel having means for interrogating each of a plurality of acoustic transponders along said cable,

(b) interrogating each of said transponders a plurality of times during each traverse of said vessel along said cable, each acoustic transponder transmitting an acoustic signal through the water to said vessel at a characteristic frequency differing from that of the other of said plurality of acoustic transponders each time it is interrogated,

(c) receiving said acoustic signals at said vessel and determining a plurality of slant range measurements for each acoustic transponder at the characteristic frequency of said acoustic transponder,

(d) measuring the water depth to said cable,

(e) plotting a set of loci of all possible positions for each



acoustic transponder from the plurality of slant range measurements obtained at each of said characteristic frequencies, the measured water depth to said cable, the known sound velocity in water, and the navigational coordinates of said vessel, and

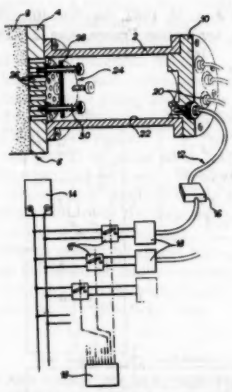
(f) identifying the exact position of each acoustic transponder by the intersection point for the plotted set of loci of possible transducer positions for said acoustic transponder.

4,513,402

EARTHQUAKE SIMULATOR

Bernard Devaure, Gradignan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 27, 1981, Ser. No. 287,085
Claims priority, application France, Aug. 13, 1980, 80 17866
Int. Cl.³ G01V *1/30*; B06B *3/00*
U.S. Cl. 367—73 **7 Claims**



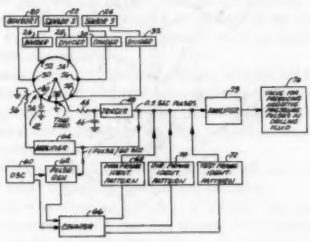
1. An earthquake simulator making it possible to produce seismic waves and apply them to a sample, wherein it comprises a generator able to produce shock waves, whose frequencies are similar to the shock wave frequencies produced in a natural earthquake, the ratio of similitude being equal to $1/\lambda$ in which λ is a positive integer, said generator being formed by a cylinder, closed at one of its ends by one of the walls of a cell containing the sample and at the other end by a thick wall to which are fixed means making it possible to produce shock

waves within the cylinder, said waves being transmitted from the interior of the cylinder to the interior of the cell by means of openings made in the walls, said waves causing movements of the sample similar to those encountered during natural earthquakes; a mechanical device functioning as a low pass filter and placed within the cylinder in the vicinity of the wall of the cell provided with the said openings, making it possible to eliminate the high frequency shock waves obtained by reflection within the cylinder, the mechanical device being constituted by studs screwed into the wall of the cell and by a plate located between two identical helical springs arranged round each of the studs, said plate havng no contact with the cylinder.

4,513,403
DATA ENCODING AND SYNCHRONIZATION FOR PULSE TELEMETRY

George W. Troy, Citrus Heights, Calif., assignor to Exploration Logging, Inc., Sacramento, Calif.

Filed Aug. 4, 1982, Ser. No. 405,063
Int. Cl.³ G01V *1/40*; H04J *7/00*; G11B *5/09*
U.S. Cl. 367—83 **19 Claims**



1. Apparatus for encoding data in a pulse telemetry system comprising means for producing a train of encoded data pulses wherein the time intervals between pairs of successive data pulses constitute measurements of the magnitude of the data parameters, and means for producing redundant pulses at known time locations with respect to and between pairs of the data pulses, for enabling the telemetry system to distinguish data pulses from noise signals because of the known time relationship between the redundant pulses and the encoded data pulses.

8. A method of well logging by telemetering information in pressure pulses in the drilling fluid from the interior of a well to the surface comprising producing encoded data pulses wherein the time intervals between pulses constitute measurements of the magnitude of data measured in the well, producing redundant pulses at known times with respect to and between the data pulses, and producing pressure pulses in the drilling fluid in accordance with the occurrence of the data pulses and the redundant pulses.

4,513,404
ACOUSTIC REFLECTOMETER FOR SHEET FEED SENSING

Raymond W. Huggins, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

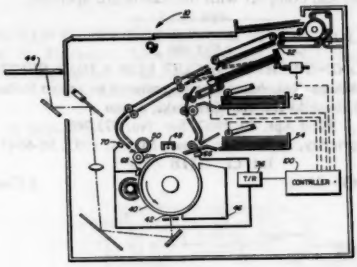
Filed Mar. 14, 1983, Ser. No. 474,914
Int. Cl.³ G08B *21/00*
U.S. Cl. 367—93 **11 Claims**

1. In a sheet transport system for conveying a sheet along a path, a sheet sensor comprising

an elongated acoustic cavity, said cavity having a plurality of spaced ports, said ports being disposed along said path, the cavity comprising a transmitter portion having a plurality of orifices and a receiver portion having a plurality of orifices, each of the transmitter orifices being aligned with a receiver orifice, said aligned orifices providing said ports,

an acoustic transmitter attached to one end of the acoustic cavity for generating sound waves in the cavity, and

an acoustic receiver responsive to the sound generating

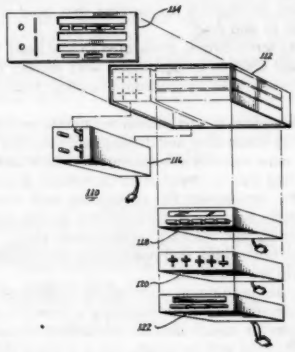


means for detecting changes in the sound waves at each of the ports in response to a sheet being present at the port wherein, in the absence of a sheet at a given port, a sound wave is transmitted from the transmitter through the transmitter orifice to the receiver orifice of the receiver portion of the acoustic cavity to the receiver.

4,513,405
AUTOMOTIVE SOUND SYSTEM

Joseph F. Hills, Scottsdale, Ariz., assignor to Jimmy's Radio & Television Corp., Phoenix, Ariz.

Filed Oct. 25, 1982, Ser. No. 436,575
Int. Cl.³ H04B *1/20*
U.S. Cl. 369—12 **16 Claims**



1. A sound system for use in automobile dashboards which permits ab initio or subsequent selection of quality and complexity of electrical signal production through post manufacture addition, deletion or interchange of elements, said sound system comprising in combination:

(a) a chassis standardized in configuration and complying in size with the requirements and parameters attendant the dashboard of an automobile, said chassis including standardized mounting means for mounting said chassis without adaptation or modification in any of a plurality of automobiles having equivalent dashboard apertures;

(b) a plurality of discrete segregable electrical signal generating components secured within said chassis;

(c) means for in field adding, deleting and interchanging selected ones of said electrical signal generating components within said chassis;

(d) means for electrically interconnecting within said chassis said electrical signal generating components; and

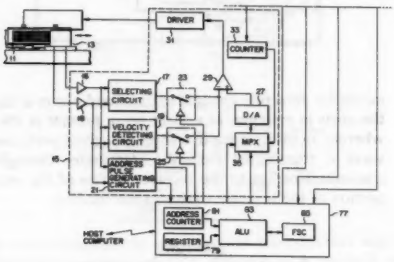
(e) a replaceable face plate for said chassis, said face plate being selectable from a group of equal sized face plates to be congruent with the components mounted within said chassis and comport with the dashboard aperture.

4,513,406

POSITIONING SERVO CIRCUIT FOR A DISK SYSTEM

Atsushi Ishihara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 30, 1982, Ser. No. 373,785
Claims priority, application Japan, May 1, 1981, 56-66472
Int. Cl.³ G11B 7/00
U.S. Cl. 369—32 **4 Claims**



1. A device for recording data on and/or reading data from a disc having a recording area on which data can be recorded/-read in the form of tracks arranged in a spiral, comprising:

means for driving said disc;

a head for recording data on said disc and/or reproducing the data therefrom;

a movable mechanism for moving said head radially with respect to said disc;

a tracking servo circuit, connected to said head, for controlling said head to be positioned with respect to a desired one of said tracks for recording/reading data on/from said disc;

positioning servo means, connected to said movable mechanism, for controlling and driving said movable mechanism at the same velocity as a velocity at which said spiral data recording area is moved in the movement direction of said movable mechanism for controlling said head so as to accurately be aligned with respect to the desired track selected by said tracking servo circuit; and

means for controlling said positioning servo means and said tracking servo circuit;

wherein said positioning servo means comprises:

(a) a selecting circuit for receiving a detection signal from a detector which detects movement of said movable mechanism and for producing a position signal indicative of the position of said movable mechanism;

(b) a velocity detecting circuit, connected to said detector, for receiving the detection signal, for differentiating the detection signal, and for producing a velocity signal indicative thereof;

(c) an address pulse generator, connected to said detector, for generating address pulses for transmission to said controlling means in response to the detection signal;

(d) counting means for producing a reference position signal in response to a rotation synchronizing clock signal from said driving means;

(e) means for generating a differential signal between the position signal from said selecting circuit or the velocity signal from said velocity detecting circuit and the reference position signal from said counting means or a reference velocity signal from said controlling means; and

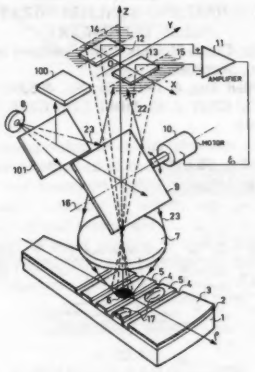
(f) driver means for driving said movable mechanism in response to the differential signal.

4,513,407

DEVICE FOR OPTICAL RECORDING AND READ-OUT OF DATA ALONG A PRERECORDED TRACK

Claude Bricot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 6, 1982, Ser. No. 395,307
Claims priority, application France, Jul. 17, 1981, 81 13979
Int. Cl.³ G11B 7/00, 21/10
U.S. Cl. 369—44 **11 Claims**



1. An optical device for recording and playback of information on and from an optical post recordable data carrier having a preformed pattern relief surface consisting of alternating track elements and lands to thereby define an optical track, said device comprising:

illuminating means for illuminating a scanned area of said track elements with spot illumination, said illuminating means being shiftable between centers of said track elements and said lands;

detecting means collecting radiation from said scanned surface area for detecting deviation of said spot illumination from said track elements and for generating a deviation signal in response to said detected deviation; and

control means operatively connected to said detecting means for receiving said deviation signal and for moving said spot illumination in response thereto to maintain tracking of said spot illumination on said track elements, and wherein

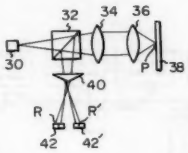
said illuminating means for (a) producing spot illumination on a center of a predetermined one of said lands to form overlapping regions with adjacent ones of said track elements, (b) producing spot illumination on a center of a predetermined one of said track elements to form overlapping regions with adjacent ones of said lands upon shifting of said illumination means from the center of said predetermined land to the center of said predetermined track element and (c) establishing a prerecording optical contrast having a predetermined sign when said spot illumination shifts from a center of said predetermined one of said track elements to the center of an adjacent one of said lands; and wherein

recording of said information produces a post recording optical contrast having said predetermined sign when said spot illumination is shifted from a post recorded area of one of said track elements to the adjacent land.

4,513,408
ERROR DETECTING SYSTEM OF VIDEO/AUDIO DISC PLAYER

Susumu Nomura, and Katsuharu Sato, both of Tokorozawa, Japan, assignors to Pioneer Video Corporation, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,244
Claims priority, application Japan, Jun. 5, 1981, 56-082958[U]
Int. Cl.³ G11B 7/00
U.S. Cl. 369—46 3 Claims



1. An optical information recording disc player in which an information recording disc optically carrying thereon video and/or audio information in the form of one or more circumferentially extending record tracks is rotated about the center axis thereof in the vicinity of an optical pick-up system, said pick-up system comprising:

optical means operative to emit a beam of light for tracing a target track of said record tracks and to produce a signal-carrying beam of light carrying thereon signals picked up from said record tracks during the rotation of the information recording disc;

beam-splitting means for splitting said signal-carrying beam of light into two component beam of light;

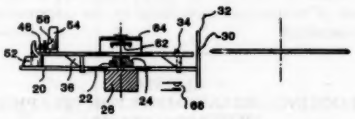
a first transducer element which is irradiated by one of said two component beams and has at least two discrete light-sensitive surfaces consisting of first and second light-sensitive surfaces which are separated from each other across a first junction line substantially parallel with a line tangent to said record tracks; and

a second transducer element which is irradiated by the other component beam and has at least two discrete light-sensitive surfaces which are separated from each other by a second junction line substantially parallel with a line perpendicular to the record tracks.

4,513,409
HELICOIDAL LOADING AND UNLOADING MECHANISM FOR DISC PLAYER APPARATUS

Marcel J. Staar, Brussels, Belgium, assignor to Staar S. A., Belgium

Filed Dec. 29, 1982, Ser. No. 454,240
Claims priority, application Belgium, Dec. 29, 1981, 891649
Int. Cl.³ G11B 25/04
U.S. Cl. 369—77.1 28 Claims



1. A loading and unloading device for a slot type disc player comprising:

a frame having a horizontal slot for a disc;

disc drive means on said frame at a level below said slot and having a rotary axis;

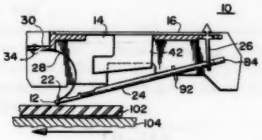
a disc carrier plate independent of said disc drive means vertically movable from a first level adjacent said slot to receive or to eject a disc through said slot and a lower level below a disc position on said disc drive means; and

means mounting said disc carrier plate on said frame for simultaneous rotational and vertical movement providing helical movement between said levels about the axis of the disc drive means to transfer a disc between said disc carrier plate and said disc drive means.

4,513,410
PICKUP CARTRIDGE HAVING STYLUS HOLDER

David W. Fairbanks, Monmouth Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 18, 1983, Ser. No. 476,908
Int. Cl.³ G11B 3/44
U.S. Cl. 369—126 12 Claims

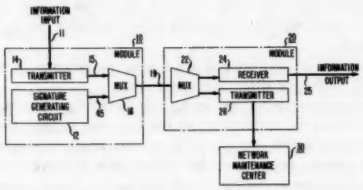


1. An elongated stylus holder for use with a flylead; said stylus holder having a stylus secured to one end thereof by inserting said stylus into said holder one end along a direction which is disposed at a non-perpendicular angle to the longitudinal axis of said holder; said one end of said holder being provided with a surface which is arranged substantially at right angles to said stylus insertion direction to facilitate said stylus insertion; said flylead having an end thereof attached to said holder-mounted stylus; said stylus holder having a raised portion adjacent to said one end of said stylus holder to guide said flylead away from said holder at a given angle when said flylead is secured to said stylus; said raised portion and said surface through which said stylus is inserted being disposed on the same side of said stylus holder; said stylus holder being dimensioned and shaped such that the resonance frequency of said stylus holder is disposed toward the upper end of the audible frequency range; wherein the disposition of the resonance frequency of said holder toward the upper end of the audible frequency range is achieved by providing a cutout in said holder on the same side thereof as said raised portion and said stylus insertion surface of said holder.

4,513,411
TRANSMISSION OF STATUS REPORT OF EQUIPMENT IN A DIGITAL TRANSMISSION NETWORK

Alexander G. Fraser, Bernardsville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 1, 1982, Ser. No. 413,606
Int. Cl.³ H04J 3/14
U.S. Cl. 370—13 11 Claims



1. Apparatus for use in the maintenance of a telecommunications network comprising

a first module for periodically transmitting a plurality of signatures for identifying equipment used in said network,

a second module at a maintenance center for receiving said signatures,

said first module comprising

means for transmitting a first stream comprising a plurality of frames of information bits,

means for periodically generating a plurality of bits representing said signature for said equipment located at said first module, and

in response to a first clock signal means for sequentially multiplexing one of said signature bits with one of said frames of said first information bit stream to derive a second bit stream.

4,513,412

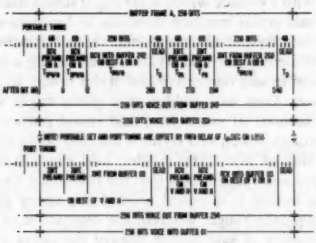
TIME DIVISION ADAPTIVE RETRANSMISSION TECHNIQUE FOR PORTABLE RADIO TELEPHONES

Donald C. Cox, Tinton Falls, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 25, 1983, Ser. No. 488,397

Int. Cl.³ H04B 7/02

U.S. Cl. 370—29 **17 Claims**



1. A portable transceiver comprising:

a controller capable or providing control signals during predetermined time periods of a time division sequence;

a transmitter capable of transmitting a digital preamble signal during a first and a second time slot of the time division sequence and a digital message signal during a third time slot of said time division sequence in response to control signals from the controller;

a receiver capable of receiving from a remote location a digital preamble signal during a fourth and a fifth time slot of said time division sequence and a digital message signal during a sixth time slot of said time division sequence and determining from said received preamble signals during the fourth and fifth time slots which includes the stronger signal;

a first and second spaced-apart antenna oriented substantially orthogonal to each other; and

means responsive to control signals from the controller for switching the transmitter to the first and second antenna during said first and second time slots, respectively, and to the antenna determined by the receiver to have received the stronger preamble signal during the fourth and fifth time slot of an immediately prior time division sequence during the third time slot and for switching the receiver to the first and second antenna during the fourth and fifth time slot, respectively, and to the antenna providing the stronger signal in the fourth and fifth time slot during the sixth time slot of said time division sequence.

4,513,413

COMMUNICATION SET AND METHOD

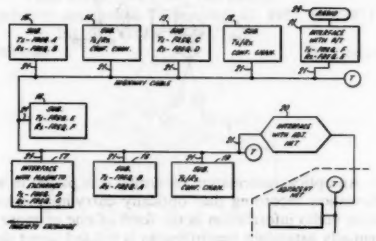
Anthony G. Gorman, Ruislip; Peter L. Smith, Prestwood, and Paul Q. Barrett, Hemel Hempstead, all of England, assignors to Racal Acoustics Limited, England

Filed Nov. 2, 1982, Ser. No. 438,450

Claims priority, application United Kingdom, Nov. 4, 1981, 8133303

Int. Cl.³ H04J 1/06

U.S. Cl. 370—30 **10 Claims**



1. A communication method for providing duplex communication between a plurality of pairs of stations on a single wire pair highway by frequency division multiplexing, each station having a station-identifying call code, the highway being assigned a plurality of pairs of frequencies for communication thereover, each pair of frequencies including a go frequency and a return frequency, said method comprising:

maintaining all presently non-communicating stations in a quiescent mode in which each monitors the highway for alert signals;

activating a quiescent station desiring to transmit information as a caller station to a called station by having such caller station monitor frequency pairs on the highway to select a pair of presently unused frequencies and, upon selecting such a pair of frequencies, to apply an alert signal and the go frequency of the selected pair of frequencies to the highway, the go frequency being modulated by the call code of the called station;

activating all quiescent stations in response to receipt thereby of the alert signal for monitoring of call codes on the go frequency of the selected pair of frequencies;

initiating transmission on the highway, by that station which was activated by the alert signal and which corresponds to the call code, of the return frequency of the selected pair of frequencies, while returning all noncalled stations which were activated by the alert signal to the quiescent condition; and

activating the caller station in response to receipt by it of the return frequency of the selected pair of frequencies to transmit on the highway the go frequency of the selected pair of frequencies modulated by the information to be transmitted.

4,513,414

CLOCKING ARRANGEMENT FOR TELEPHONE SWITCHING SYSTEM

Paul H. Knapke, Columbus, and Robert L. Miller, Westerville, both of Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,930

Int. Cl.³ H04J 3/14

U.S. Cl. 370—58 **28 Claims**

1. In a telephone switching system,

a first line clock having a given frequency;

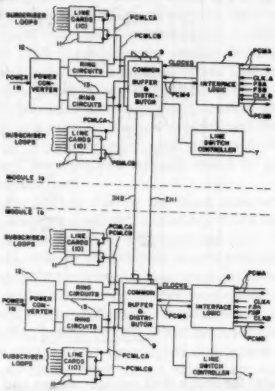
a second line clock having said given frequency;

first clock signal means for deriving a first clock from said first line clock;

second clock signal means for deriving a second clock from said second line clock;

first selector means coupled to said first and second clock signal means for selecting one of said first and second clock as a clock output in response to first control signals;

failure detecting means for detecting failures in said first and second line clocks and for providing signals indicating a failure; and



a microprocessor coupled to said first selector means for providing said first control signals to select said one of said first and second clocks, said microprocessor being coupled to said failure detecting means and responsive to said failure detecting means indicting a failure in said selected one clock for generating second control signals to cause said first selector means to select the other one of said first and second clocks as said clock output.

4,513,415

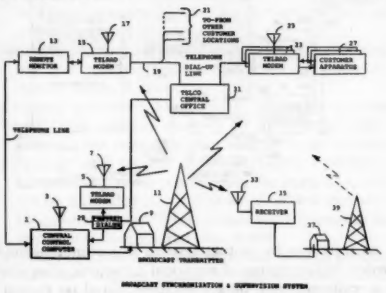
BROADCAST SYNCHRONIZATION AND SUPERVISION SYSTEM

Louis Martinez, Carson, Calif., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 87,543, Oct. 23, 1979, Pat. No. 4,322,842. This application Mar. 30, 1982, Ser. No. 363,613

Int. Cl.³ H04J *3/06, 3/12*

U.S. Cl. 370—92 **56 Claims**



1. A broadcast system for enabling independent communication with a plurality of remote locations comprising

broadcast station transmitter means for broadcasting normal program material

central control means at a central location for generating digital address and control signals

means coupled to said central control means and said broadcast station transmitter means for causing the broadcasting of said digital address and control signals with said normal program material in a manner so as to be substantially noninterfering with the reception of the normal program material

a plurality of remote receivers for receiving and detecting said digital address and control signals broadcast by said broadcast station transmitter, each said receiver having a preassigned address and including address detection means for determining the coincidence between a broadcast address and the preassigned address of the respective receiver, and

enabling means associated with each of said receivers and responsive to said address detecting means therein to enable the establishment of an independent bidirectional communication link between said remote location and said central location.

4,513,416

SYSTEM FOR ADJUSTING A TIME AXIS BY USING A CONTROL AND AN ADJUSTMENT TIME SLOT IN A SATELLITE STATION OF A TDMA NETWORK

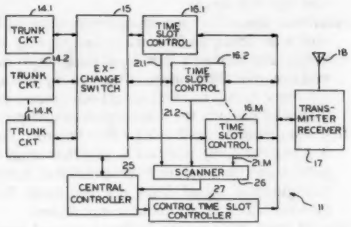
Ryuhei Fujiwara, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,677

Claims priority, application Japan, Mar. 10, 1982, 57-36654

Int. Cl.³ H04J *3/06*

U.S. Cl. 370—100 **4 Claims**



1. A time axis adjusting system for use in a radio communication network in which time division multiple access communication is carried out between a central station and a plurality of satellite stations by the use of signals sent in first frames and received in second frames at said central station, each of said first and said second frames comprising a predetermined number of consecutive speech time slots each having a common time slot length, said consecutive time slots being identified by consecutive number codes, each first frame further comprising a control time slot including a frame synchronization code as a part of said signals, said satellite stations comprising time axis generating means for generating time axes specific thereto, said generated time axis being for defining local time slots in which signals are sent to be received at said central station in said second frames from those of said satellite stations which are carrying out the time division multiple access communication, wherein said central station comprises:

first central station means for checking whether or not more than a preselected number of the speech time slots are idle time slots in each of said first and said second frames and for assigning one of said idle time slots in one each of said first and said second frames to one of said satellite stations as an adjustment time slot for use in adjusting the time axis specific to said one of the satellite stations; and

second central station means coupled to said first central station means for transmitting a number code in said con-

trol time slot, said number code being representative of the number given to said adjustment time slot.

4,513,417

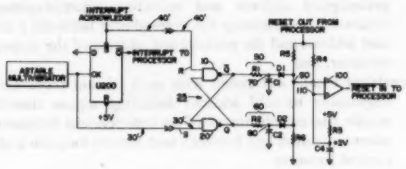
AUTOMATIC PROCESSOR RESTART CIRCUIT

James S. Lamb, Portland, and Warren K. Wimmer, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 29, 1982, Ser. No. 445,342

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—12 **3 Claims**



1. A processor restart circuit that monitors a regularly serviced processor signal and automatically provides a reset signal to a processor when the frequency of said regularly serviced processor signal changes, said restart circuit comprising:

flip-flop means coupled to receive the regularly serviced processor signal for providing an output signal having a duty cycle proportional to the frequency of the regularly serviced processor signal;

low-pass filter means having an input coupled to an output of said flip-flop means, and an output for providing a voltage proportional to the average value of said output signal of said flip-flop means;

reference means for providing a reference voltage against which the low-pass filter means output may be compared;

a comparator having a first input coupled to said output of said low-pass filter means, a second input coupled to said reference means to receive said reference voltage, and an output to provide the reset signal to said processor;

first reset input means having a first resistor, one end of said first resistor being coupled to said first input of said comparator and the other end being coupled to receive a reset configuration signal from the processor for providing hysteresis for the comparator inputs; and

second reset input means having a second resistor, one of said resistor being coupled to said second input of said comparator and the other end of said second resistor being coupled to receive a reset configuration from the processor for terminating the reset signal to the processor.

4,513,418

SIMULTANEOUS SELF-TESTING SYSTEM

Paul H. Bardell, Jr., Carmel, and William H. McAnney, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,070

Int. Cl.³ G01R *31/28*; G06F *11/00*

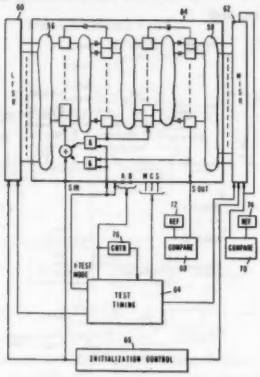
U.S. Cl. 371—25 **2 Claims**

1. In a combinational and sequential logic circuit with memory circuits on individual logic units coupled together to form a shift register scan path for testing logic circuits and uncoupled to disable the scan path while the logic circuit is performing its designed logic function, a method for performing self-testing using a multistage generator means to generate testing sequences for the self-testing and multistage data compression means to compress the responses of the logic circuits comprising:

(a) forming the shift register scan path on the logic unit into a single linear feedback shift register means capable of forming multistage random signal generator means for a multistage data compression means,

(b) shifting data through said linear feedback shift register means to transmit the data as a test input from memory circuits of said linear feedback shift register means and simultaneously capture the response to the shifted data in the same memory circuits of said linear feedback shift register means;

(c) using the captured response to the shifted data as a further test input transmitted from said memory circuits of



said linear feedback shift register means and capturing the response to said further test input in the same memory circuits;

(d) repeat step (c) n times;

(e) reading the contents of said linear feedback means out of said scan path after step (d) as the test result.

4,513,419

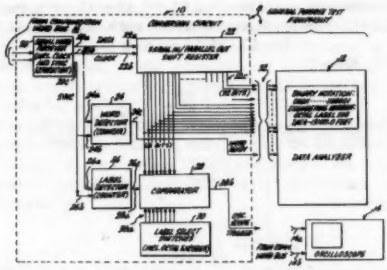
DIGITAL CONVERSION CIRCUIT AND METHOD FOR TESTING DIGITAL INFORMATION TRANSFER SYSTEMS BASED ON SERIAL BIT COMMUNICATION WORDS

Vincent J. Small, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 25, 1982, Ser. No. 436,427

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—29 **8 Claims**



1. In an apparatus for testing systems that communicate by transmission and reception of electrical communication words having a predetermined, binary encoded, serial bit format in which successive words are separated by a predetermined synchronizing time gap, a circuit for receiving and reformating said communication words for facilitating analysis thereof, comprising:

signal receiving means having an input adapted to receive said communication words and including means for separating and outputting a serial data signal component and a

clock signal component, said clock signal component representing a bit rate of said serial data signal component, and wherein said signal receiving means further includes means for detecting and separately outputting a sync signal component representing said synchronizing time gap between successive communication words;

serial to parallel shift register means having a serial data input connected to said receiving means to receive said serial data signal component and said clock signal component, and having a plurality of parallel data outputs, one for each serial bit in said communication words, said serial to parallel shift register means further having a register section associated with a predetermined first subset of bits of said communication word and having means for reversing the serial order in said register section such that the corresponding parallel outputs present said first subset of data bits in a reverse order with respect to the order in which they are received by said serial to parallel shift register means; and

word detector means having an input connected to said signal receiving means and including clock signal counting means for receiving and counting said clock signal component, said word detector means producing a word loaded signal in response to said counting means accumulating a predetermined count corresponding to the number of serial bits in said communication word, and wherein said counting means of said word detector means is connected to receive said sync signal component and is provided with count reset means that resets said counting means in response to said sync signal component, whereby the occurrence of said word loaded signal represents the condition of said shift register means in which said plurality of parallel outputs, including those corresponding to said register section containing the reversed ordered first subset of data bits, are ready with the reformatted, parallel data, communication word.

4,513,420

ERROR DETECTING SYSTEM

Donald A. Collins, Easley, and Thomas B. O'Hanlan, Liberty, both of S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 22, 1982, Ser. No. 443,809
Int. Cl.[3] G06F *11/10*
U.S. Cl. 371—38 **1 Claim**

1. A computer memory system comprising;

a main processor device for receiving a plurality of data words to be stored in memory;

a large capacity dynamic random access memory with a refresh cycle for storing a plurality of data words received from said main processor device;

a small capacity static random access memory separate from said large capacity memory for storing a plurality of 15 bit error correction codes;

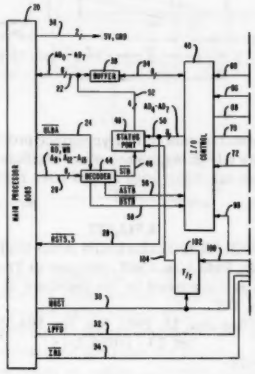
battery means connected to said static random access memory for operating said static memory when a system power failure occurs;

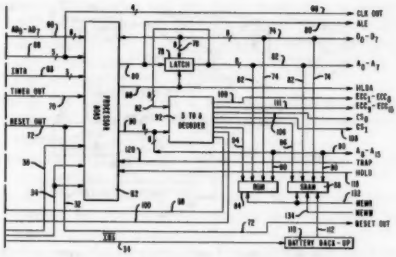
a control processor connected to said main processor and said large capacity memory for transferring data words between the main processor and the large memory;

a dynamic shift register circuit including a plurality of Exclusive OR circuits representing the terms of a polynomial which is divided into a data word shifted into said circuit to generate a multi-bit remainder comprising an error correction code for the data word;

a DMA controller connected to said control processor and said shift register circuit for simultaneously loading the same data word being written into and read from said large capacity memory into said shift register circuit enabling said register circuit to generate a first 15 bit error correction code for each data word being written into the large capacity memory and a second error correction code for the same data word when read from the large capacity memory, said first error correction code being stored in said small capacity memory at the same address as the address of its corresponding data word is stored in the large capacity memory;

address generating means connected to said large capacity memory and said small capacity memory for generating an address used in storing a data word in said large capacity memory and its corresponding error correcting code in said small capacity memory;





and said control processor being further connected to said small capacity memory and said shift register circuit for comparing the first and second error correction codes for each data word stored in said large capacity memory for detecting an error in a data word when the error correction codes do not match.

4,513,421

PERIPHERAL GAIN SUPPRESSION IN A LASER MEDIUM

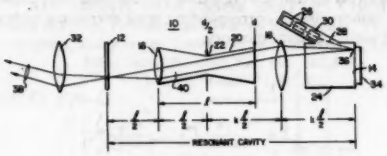
Albert B. Welch, Dallas, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,847
Int. Cl.[3] H01S *3/10*
U.S. Cl. 372—24 **15 Claims**

1. An apparatus for generating a scanning laser beam comprising:

An active laser medium; means for pumping said laser medium in a resonant cavity to build a population inversion, said resonant cavity including a control reflector having a reflective surface with a fixed uniformly reflecting pattern of material disposed on the reflective surface of said control reflector and having a fixed reflectance so as to sustain optical oscillations at a first population inversion level providing a generally uniform population inversion in said laser medium, and a second pattern of material also disposed on the reflective surface of said control reflector

having a reflectance-transmissive state transition responsive to an external stimulation; and means for generating said external stimulation resulting in a selected pattern



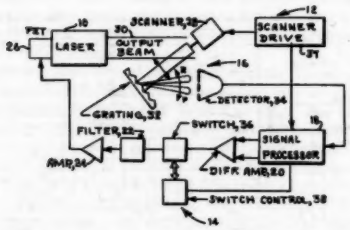
being formed on said reflective surface producing a reflectance state which maintains optical oscillations at a second population inversion level in said laser medium.

4,513,422

CO_2 LASER STABILIZATION AND SWITCHING

Neal E. Buholz, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1983, Ser. No. 504,353
Int. Cl.³ H01S 3/13
U.S. Cl. 372—29 **9 Claims**



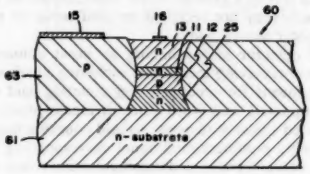
1. A laser stabilization and switching circuit comprising:
a laser for outputting a radiant energy carrier beam having therein a plurality of lines;
scanning means for extracting a portion of said carrier beam, said portion forming a detector beam that is reciprocally rotated by said scanning means;
detecting means for receiving said detector beam, said detecting means separating said detector beam having said plurality of lines therein into separate line beams, said detecting means outputting a power signal from each of said line beams;
a signal processor for outputting a plurality of line beam signals in parallel, said signal processor receiving said power signals and a scanning signal from said scanning means, the difference between each line beam signal indicating a difference in power between each of said plurality of lines in said radiant energy carrier beam from said laser for purposes of negative feedback control;
a differential amplifier, said differential amplifier receiving said plurality of line beam signals from said signal processor and outputting a feedback correction signal;
switching means for causing said laser to change operating points, said switching means receiving said feedback correction signal from said differential amplifier, said switching means outputting a stabilize/switch signal;
filter means for removing undesired frequencies from said stabilize/switch signal and outputting a filtered signal;
amplifying means for receiving said filtered signal and outputting an amplified signal; and
means for changing the operating point of said laser, said means for changing receiving said amplified signal from said amplifying means whereby said laser switches operating points in a predetermined manner and outputs said carrier beam having a different plurality of lines therein.

4,513,423

ARRANGEMENT FOR DAMPING THE RESONANCE IN A LASER DIODE

Joseph Katz, Pasadena; Amnon Yariv, San Marino, and Shlomo Margalit, South Pasadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 4, 1982, Ser. No. 385,220
Int. Cl.³ H01S 3/19
U.S. Cl. 372—50 **16 Claims**



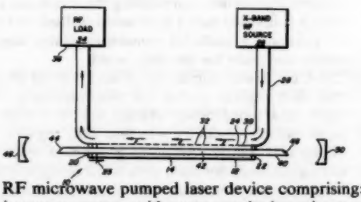
1. In a structure of an injection laser diode, an improvement comprising:
first, second, third and fourth layers of semiconductor material grown one upon the other, each of preselected properties, said second layer comprising the active region of said laser diode with said first and third layers on opposite sides of said second layer representing the diode's cladding layers, said first and second layers together forming an emitter of a bipolar transistor, said third layer forming the base and said fourth layer forming the transistor collector;
a laser diode driving source connected between said first and third layers respectively; and
impedance means comprising capacitance for providing an impedance which is not greater than a preselected value connected between said third and fourth layers when said laser is driven by said driving source with signals of a frequency not less than a preselected frequency.

4,513,424

LASER PUMPED BY X-BAND MICROWAVES

Ronald W. Waynant, 13101 Claxton Dr., Laurel, Md. 20708; Leonard Epp, Box 192, Gallant-Green Rd., Waldorf, Md. 20601, and Clad P. Christensen, Jr., 2233 Arlington Ter., Alexandria, Va. 22303

Filed Sep. 21, 1982, Ser. No. 420,990
Int. Cl.³ H01S 3/09, 3/23
U.S. Cl. 372—68 **5 Claims**



1. In an RF microwave pumped laser device comprising:
an RF microwave source, said source producing microwave output radiation in the frequency range of 8 to 12 GHz;
cavity means resonant at the frequency of said microwave

output radiation of said source for receiving said microwave radiation and for producing a standing wave pattern therein in response thereto;

waveguide means for transmitting said microwave radiation from said source to said cavity means;

coupling means for coupling said microwave radiation from said waveguide means into said cavity means, said coupling means including a coupling plate forming a common wall between a portion of said waveguide means and a portion of said cavity means, said coupling plate including a plurality of openings therein through which said microwave radiation passes;

a plurality of laser tubes each containing a laser medium different from that contained in the remainder of said plurality of laser tubes, at least a portion of each of said plurality of laser tubes being located within said cavity means, each laser medium within each of said plurality of laser tubes being excited by said standing wave pattern; and

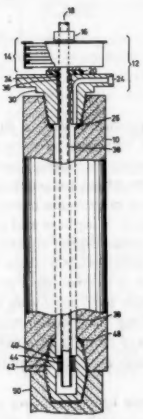
feedback means associated with said laser tubes for receiving optical radiation produced by said excited lasing mediums and for redirecting said optical radiation back into said lasing mediums.

4,513,425

COMPOSITE ELECTRODE FOR ARC FURNACE

Berch Y. Karagoz, Grand Island; Martin M. Turban, Lewiston; Lyman T. Moore, Niagara Falls, and Mark D. Travers, Ransomville, all of N.Y., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,266
Int. Cl.³ H05B *7/06*
U.S. Cl. 373—88 **13 Claims**



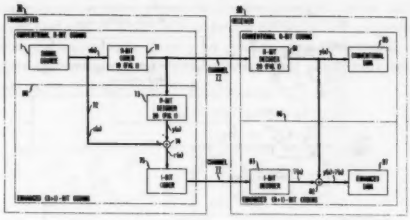
1. A water-cooled composite tubular electric furnace electrode having a hollow graphite body component with a central bore having a coolant supply pipe therein attached to a header assembly at one end, a hollow nipple at the other end, said coolant supply pipe utilized to create a compressive force on said electrode by tension between said header and said nipple prestressing said graphite body component.

4,513,426

ADAPTIVE DIFFERENTIAL PULSE CODE MODULATION

Nuggehally S. Jayant, Short Hills, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1982, Ser. No. 451,487
Int. Cl.³ H04B *12/04*
U.S. Cl. 375—26 **2 Claims**



1. In an adaptive differential PCM (ADPCM) transmission terminal wherein an input source signal is converted into a quantized differential PCM output signal,

a difference circuit to which samples of the input signal and a signal estimate of the same are coupled, said difference circuit providing an output difference signal indicative of the difference between the two inputs thereto,

an integrator means for producing said signal estimate,

adaptive quantizing and encoding means for receiving said difference signal and providing at its output a quantized differential PCM encoded version of the difference signal, said differential PCM coded output comprising R-bit DPCM signals,

means for carrying out a noninstantaneous, explicit and separate coding of quantization noise comprising at the transmission terminal

means for reconstructing a replica of said source signal from its quantized differentially encoded version,

means for subtracting the replica of said source signal formed by the reconstructing means from said source signal to obtain a quantization noise error signal,

buffer means for storing a predetermined number N of R-bit DPCM signals,

average coder means for digitally coding samples of said quantization noise error signal into R-bits per sample, one bit per sample, or zero bits per sample such that the total number bits over a predetermined number of samples N is the same as said predetermined number N, and

allocation logic means responsive to said R-bit signals stored in said buffer means at a given time to control said average coder means to encode each maximum level noise error sample into an R-bit code, each minimum level noise error sample corresponding to granular noise into zero bits per sample, and all other noise error samples into a single bit.

4,513,427

DATA AND CLOCK RECOVERY SYSTEM FOR DATA COMMUNICATION CONTROLLER

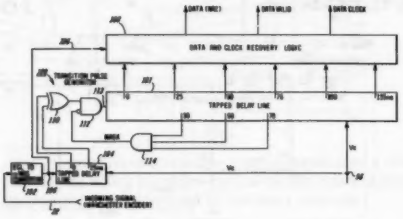
Gaetano Borriello; Richard F. Lyon, and Alan G. Bell, all of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1982, Ser. No. 412,637
Int. Cl.³ H04L *7/06*
U.S. Cl. 375—110 **8 Claims**

1. A data and clock recovery system for recovery of phase encoded data from a data packet received by a data communication controller, said data packet including a plurality of data bit cells with one portion of each bit cell representing a logical complement of the bit value encoded and the other portion of each bit cell representing the bit value encoded whereby some transitions in a stream of said data bit cells represent one of two

bit values while others represent between bit transitions, said system comprising

delay means including a plurality of delay stages to apply a predetermined amount of unit delay to all of said transitions to generate a transition pulse for every transition in said data packet,



means to develop a mask from said transition pulses representative of the time occurrence of said between bit transitions,

means to apply said mask to said data packet whereby said encoded bit values are recovered therefrom, and

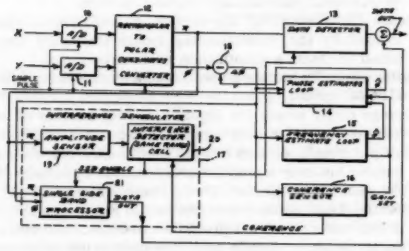
means to calibrate said delay means to ensure that each of said delay stages continuously impose said predetermined unit delay per stage.

4,513,428

SIMULTANEOUS DETECTION OF TIME COINCIDENT SIGNALS IN AN ADAPTIVE DOPPLER TRACKER

Allan W. Roeder, Whitesboro, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1981, Ser. No. 329,557
Int. Cl.[3] H03D *13/00*
U.S. Cl. 375—120 **14 Claims**



1. In a communications system, a digital adaptive doppler tracker, including a sample data phase locked loop and a circuit for detecting and demodulating interfering signals: said sample data phase locked loop comprising:

rectangular to polar coordinate conversion means receiving digitized bipolar X, Y in-phase and quadrature input signals and outputting polar digital signals R, ϕ,

subtractor means subtracting a phase estimate signal ϕ from said phase signal ϕ to provide a phase error signal ϕE,

a coherence sensor receiving said phase error signal ϕ_E, and providing the coherence function $C_{(i+1)}=C_{(i)}-f(\phi_E)$, $f(\phi_E)$ being a function of phase estimate signal ϕ, said coherence sensor developing signals indicating coherence and non-coherence conditions and bandwidth control signals,

a frequency estimate loop receiving said phase error signal ϕ_E and said bandwidth control signal and providing the frequency function $F_{(i+1)}=\phi_{E(i)}\cdot K_2+F_{(i)}$,

a phase estimate loop receiving said phase error signal ϕE, said bandwidth control signal and said frequency function and providing the phase function $\phi_{(i+1)}=\phi_{E(i)}\cdot K_1+\phi_{(i)}+F_{(i)}$, K_1 and K_2 being values selected as a function of coherence function C, and

data detection means receiving polar digital signal R, phase estimate signal ϕ and the phase function output of said phase estimate loop and providing an output $D_o=R\cos\phi_E$ therefrom; and, said circuit for detecting and demodulating interfering signals comprising,

an amplitude sensor receiving polar amplitude signals R from said rectangular to polar coordinate conversion means and generating a strong signal output in response to interfering input signals,

an SSB processor receiving said phase error signal and the outputs of said rectangular to polar coordinate conversion means, and

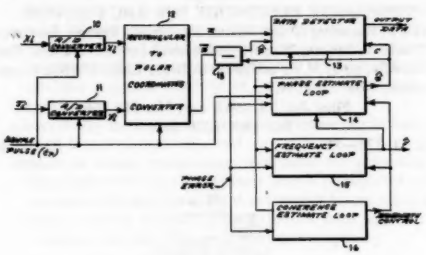
an interference detector receiving said strong signal from said amplitude sensor and signals indicating coherence and non-coherence from said coherence sensor and generating an SSB enable signal in response to the coincidence of said strong signal and a non-coherence condition signal, said SSB enable signal being applied to enable said SSB processor and disable said data detection means.

4,513,429

SAMPLE DATA PHASE LOCKED LOOP FOR ADAPTIVE DOPPLER TRACKER

Allan W. Roeder, Whitesboro, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1981, Ser. No. 329,558
Int. Cl.[3] H03D *13/00*
U.S. Cl. 375—120 **12 Claims**



1. In a communications system a digital adaptive doppler tracker operating in response to system control signals, said adaptive doppler tracker including a sample data phase locked loop, said sample data phase locked loop comprising

rectangular to polar coordinate conversion means receiving digitized bipolar X, Y inphase and quadrature input signals and outputting polar digital signals R, $\hat{\phi}$,

subtractor means subtracting a phase estimate signal ϕ from said phase signal $\hat{\phi}$ to provide a phase error signal ϕ_E,

a coherence estimate loop receiving said phase error signal ϕ_E and providing the coherence function, $\hat{C}_{(i+1)}=\hat{C}_{(i)}-f(\phi_E)$, $f(\phi_E)$ being a function of phase error., said coherence estimate loop developing a bandwidth control output signal,

a frequency estimate loop receiving said phase error signal ϕ_E and said bandwidth control signal and providing the frequency function, $\hat{F}_{(i+1)}=\phi_{E(i)}\cdot K_2+\hat{F}_{(i)}$,

a phase estimate loop receiving said phase error signal ϕ_E said bandwidth control signal and said frequency function $\hat{F}$ and providing the phase function $\phi_{(i+1)}=\phi_{E(i)}\cdot K_1+\hat{\phi}_{(i)}+\hat{F}_{(i)}$ the values of K_1 and K_2 being selected as a function of coherence function $\hat{C}$, and

data detection means receiving polar digital signal R, phase estimate signal $\hat{\phi}$ and the phase function output of said

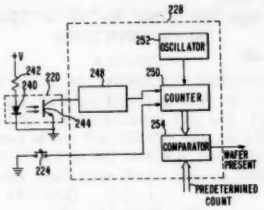
phase estimate loop and providing an output $D_o = R \cos \phi_E$ therefrom.

4,513,430

MISSING OR BROKEN WAFER SENSOR

Mahasukh Vora, and Rajender Malhotra, both of Beverly, Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 24, 1982, Ser. No. 381,290
Int. Cl.[3] **G01B** *11/04;* **G04F** *10/04*
U.S. Cl. 377—39 **6 Claims**



1. Apparatus for detecting a condition wherein a wafer in a wafer transfer mechanism is missing or broken, said apparatus comprising:

transfer means for moving said wafer from a first position along a prescribed path to a second position;

oscillator means;

counter means having a count input coupled to the output of said oscillator;

first sensing means for sensing movement of said transfer means from said first position along said prescribed path and for thereupon enabling said counter means;

second sensing means for non-contact sensing of said wafer in said transfer means at an intermediate position along said prescribed path without interrupting the movement of said wafer and for thereupon inhibiting said counter means, said second sensing means comprising a light emitting element having a beam directed laterally across said prescribed path and a photosensor directed laterally across said prescribed path and positioned to receive said beam; and

comparator means for comparing the accumulated count in said counter means with a predetermined count representing the presence of a non-broken wafer and for providing an output signal of a first state when the accumulated count equals the predetermined count and of a second state when the accumulated count and the predetermined count are not equal,

said second state of said comparator output signal representing said condition wherein said wafer is broken or missing.

4,513,431

CHARGE COUPLED DEVICE OUTPUT CIRCUIT STRUCTURE

Savvas G. Chamberlain, Waterloo, Canada, and Eugene S. Schlig, Somers, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,587
Int. Cl.[3] **G11C** *19/28;* **H01L** *29/78*
U.S. Cl. 377—60 **6 Claims**

1. An output circuit arrangement for operating a charge coupled device structure,

said structure comprising

a semiconductor substrate of one conductivity type,

a layer of semiconductor material of another type implanted on said substrate,

one deposit of enhanced semiconductor material of said other type diffused into said layer to form a floating diffusion,

another deposit of said enhanced semiconductor material diffused into said layer at a location spaced apart from the location of said one deposit to form a drain diffusion,

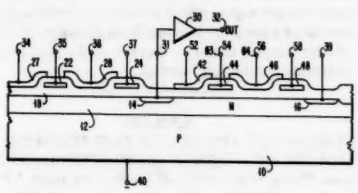
an output signal terminal electrically connected to said floating diffusion,

a return potential terminal electrically connected to said drain diffusion,

a multiple of at least two electrodes formed above said layer and spaced apart in succession preceding said one deposit,

a multiple of at least three electrodes formed above said layer and spaced apart in succession between said deposits with each electrode having an electric circuit terminal,

a layer of insulating material between said electrodes and said layer of implanted material,



an output potential translating circuit having an input terminal connected to said output terminal and having a circuit output terminal,

a source of first clocking wave connected to the first appearing electrode of said at least two electrodes preceding said floating diffusion and to the intermediate electrode of said multiple of electrodes succeeding said floating electrode,

circuitry for applying a second reset wave of pulse energy to the first of said multiple of at least three electrodes succeeding said floating diffusion, and

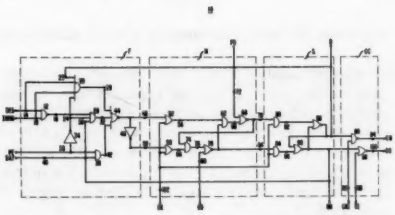
circuitry for applying set pulse energy to the second of the last of said at least two electrodes preceding said floating diffusion, and to the last of said multiple of at least three electrodes succeeding said floating diffusion.

4,513,432

MULTIPLE SELF-CONTAINED LOGIC GATE COUNTER CIRCUIT

Surender K. Gulati, Catasauqua, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1982, Ser. No. 393,544
Int. Cl.[3] **H03K** *21/06, 21/10, 23/08*
U.S. Cl. 377—121 **8 Claims**



1. Circuitry comprising:

a plurality of interconnected essentially identical stages in which each stage, with the possible exception of the first and last stages, comprises:

a memory circuit having a first input terminal, a second input clock terminal which is for coupling to a source of clock signals, and a first output terminal which is characterized by being at a logic state determined by the memory circuit;

feedback circuit means having a first input feedback terminal coupled to the memory circuit output terminal, a second input inhibit terminal, and an output terminal coupled to the first input terminal of the memory circuit; and

carry circuit means having first and second input terminals and a first output terminal;

the first input terminal of the carry circuit means being coupled to the first output terminal of the memory circuit;

the second input terminal of the carry circuit means being coupled to the second inhibit input terminal of the feedback circuit means and being coupled to the first output terminal of the carry circuit means of a preceding stage if same exists;

the carry circuit means of each stage being characterized by generating a signal which selectively inhibits the memory circuit of a subsequent stage from changing the logic state of the output terminal thereof such that the circuitry performs a counting function.

4,513,433

FLUOROSCOPY APPARATUS FOR FORMING LAYER IMAGES OF A THREE-DIMENSIONAL OBJECT

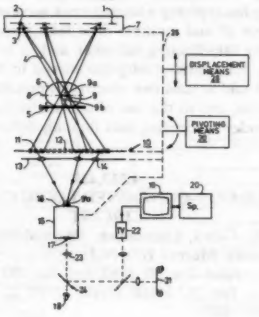
Hermann Weiss, Hamburg; Rolf Linde, Haseldorf; Ulf Tiemens, Iserlohn, and Erhard Klotz, Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 301,853, Sep. 14, 1981, abandoned. This application Mar. 22, 1984, Ser. No. 592,319

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037621

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—2 **7 Claims**



1. Apparatus for layer-wise imaging of an object (6) comprising:

a plurality of radiation source means (2), which are disposed adjacent the object in a single radiation source plane (1), each of which projects a beam (4) of penetrating radiation through the object in a geometry wherein all of the radiation beams have approximately the same cross section area in an irradiation plane (8) which intersects the object and all of the beams cover substantially the same region of the irradiation plane;

record carrier means (10), disposed on the opposite side of the object from the radiation source plane to receive the radiation beams which have passed through the object and to record therefrom perspective images of the object which are formed by the radiation beams;

image display means (15) including an image receiving surface (16);

imaging matrix means (13), comprising a plurality of imaging elements (14) which are disposed in a geometry which corresponds to the distribution of the radiation source means in the radiaton source plane, whih produce an image of a layer within the object by superpositioning the perspective images on the image receiving surface; and

means (28) for producing a relative displacement between the position of the irradiation plane and the object in a direction perpendicular to the irradiation plane.

4,513,434

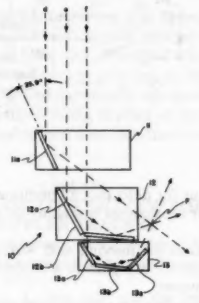
X-RAY REFLECTIVE OPTICAL ELEMENTS

Aubrey J. Dunn, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,724

Int. Cl.³ G01N *23/20*

U.S. Cl. 378—85 **2 Claims**



1. A reflective optical element for incident penetrating electromagnetic radiation including an echelon array of reflectors for the radiation, wherein each reflector includes at least one crystal at the Bragg angle for the incident radiation, and successive members of said echelon have a successively greater number of crystals.

4,513,435

SYSTEM OPERABLE AS AN AUTOMATON FOR RECOGNIZING CONTINUOUSLY SPOKEN WORDS WITH REFERENCE TO DEMI-WORD PAIR REFERENCE PATTERNS

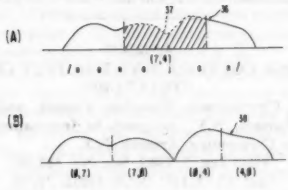
Hiroaki Sakoe, and Seibi Chiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,637

Claims priority, application Japan, Apr. 27, 1981, 56-63666

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—41 **7 Claims**



1. A continuous speech recognition system for recognizing a succession of continuously spoken words with reference to a plurality of preselected reference words, each reference word having an intra-word characteristic point approximately at a point of bisection of said reference word, said system comprising:

means for memorizing a plurality of discrete demi-word pair reference patterns, each reference pattern being given by a sequence of parameters characteristic of a demi-word

pair which lies between the intra-word characteristic point of a preceding reference word and the intra-word characteristic point of a succeeding reference word, said preceding and said succeeding reference words being continuously pronounced; and

means connected to said reference pattern memorizing means to be operable as a finite-state automaton to recognize said succession by using a pattern concatenation of optimum demi-word pair reference patterns which are selected from said discrete demi-word pair reference patterns and concatenated at least at an interface, said automaton being for controlling said concatenation so that no contradiction occurs at every interface.

4,513,436
SPEECH RECOGNITION SYSTEM

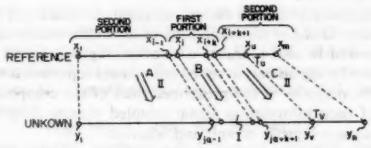
Isamu Nose, and Akihiko Umehara, both of Tokyo, Japan, assignors to Oki Electric Industry, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 302,190, Sep. 14, 1981. This application Feb. 23, 1984, Ser. No. 582,134

Claims priority, application Japan, Sep. 16, 1980, 55-127122; Sep. 16, 1980, 55-127123

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—43 **3 Claims**



1. A method of recognizing speech wherein a reference feature vector system is partitioned in memory into a reference first portion of feature vectors, which has a constant time duration independent of a speaker, and a reference second portion of feature vectors, which has a time duration dependent on a speaker, and said reference feature vector system is compared to unknown speech having an unknown first portion of feature vectors and an unknown second portion of feature vectors, comprising the steps of:

(a) locating a first portion of feature vectors in said reference feature vector system,

(b) locating unwarped candidate first portions in said unknown speech by shifting said reference first portion through said unknown speech and comparing said reference first portion with said unknown speech,

(c) matching said reference first portion with one of said candidate first portions in said unknown speech; and

(d) matching said reference second portion with said unknown second portion by linearly designating each feature vector of said unknown second portion to a feature vector in said reference second portion.

4,513,437
DATA INPUT PEN FOR SIGNATURE VERIFICATION

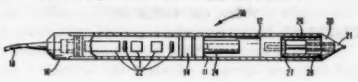
Timothy J. Chainer, Mahopac; Robert A. Scranton, South Salem, and Thomas K. Worthington, Tarrytown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 394,043

Int. Cl.³ G06K *9/24*

U.S. Cl. 382—3 **10 Claims**

1. A data input pen particularly adapted for use within an electronic Signature Verification System comprising an elongated body member having a writing tip at one end and means at the other end for connecting the pen in signal transmitting relationship with a host computer, means within said pen for producing signals representative of transverse acceleration forces acting upon said pen, said last named means comprising at least two orthogonally disposed piezoelectric transducer elements cantilevered from a suitable support surface perpendicular to the pen axis and extending in a direction parallel to the pen axis, said transducer elements having electrodes on



opposite surfaces of their piezoelectrically active regions and extending for substantially the length of said elements, means for interconnecting electrodes on opposite sides of said elements to detect quadrature acceleration signals produced by said transducer elements.

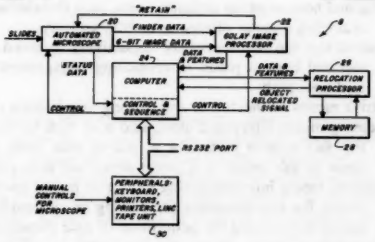
4,513,438
AUTOMATED MICROSCOPY SYSTEM AND METHOD FOR LOCATING AND RE-LOCATING OBJECTS IN AN IMAGE

Marshall D. Graham, Framingham, and David D. Cook, Jr., Concord, both of Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 15, 1982, Ser. No. 368,855

Int. Cl.³ G06K *9/20*

U.S. Cl. 382—6 **29 Claims**



1. A microscopy system for automatically locating objects-of-interest in an image having one or more objects against a background, each of said objects-of-interest being characterized by a predetermined set of features, comprising:

object identifier including

i. detecting means for scanning said image and detecting one or more of said objects during said scanning,

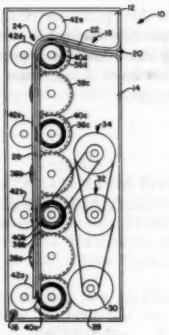
ii. feature extraction means for identifying ones of said detected objects having said predetermined set of features as objects-of-interest,

iii. object marker means for generating a marker signal for each of one or more identified object-of-interest, said marker signal having a feature portion representative of said predetermined set of features of said identified object-of-interest, and a pattern portion representative of the relative distance and relative orientation of a plurality of detected objects neighboring said identified object-of-interest.

4,513,439
SECURITY VALIDATOR

Robert L. Gorgone, Mentor; Gerald M. Iannadrea, Painesville; Anthony H. Dolejs, Bedford Heights; Bruce R. Knox, Wickliffe, and Alan J. Kovach, Cleveland, all of Ohio, assignors to Ardac, Inc., Eastlake, Ohio

Filed Jul. 12, 1982, Ser. No. 397,023
Int. Cl.[3] G06K 9/00
U.S. Cl. 382—7 1 Claim



1. A note acceptor for receiving and determining the authenticity of a paper security such as a currency, bank notes, and the like, comprising:

top and bottom plates defining a note path therebetween for receiving a paper offered as a valid security;

paired top and bottom rollers respectively received by said top and bottom plates in contacting engagement within said note path;

drive means connected to and driving said bottom rollers;

sensing means interposed along said note path between said top and bottom plates for acquiring data from specific areas on said paper as it passes along said note path;

control means interconnecting said drive means and sensing means for synchronizing the passing of said paper along said note path and the acquisition of data therefrom;

comparison means operatively connected to and receiving said data from said sensing means and determining the validity of the paper as a function of the difference between said data and reference values obtained from a plurality of valid securities, wherein:

said comparison means comprises a memory having said reference values stored therein;

said sensing means and control means acquire data from a plurality of points upon said paper security and obtain the result of a function including the difference between the data obtained from each point with a corresponding reference value for such point;

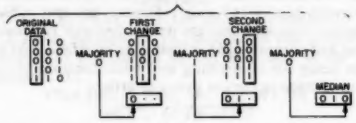
said comparison means further adds said result for each said point with the summation of results for all prior points, acquiring a final aggregate which is compared against a reference aggregate value to determine the validity of the paper; and

said control means obtains the results of a function including the difference between the data obtained from each point and a plurality of corresponding reference values for such point.

4,513,440
HARDWARE MEDIAN FILTER

Dennis J. Delman, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 29, 1982, Ser. No. 393,331
Int. Cl.[3] G06K 9/00; G06F 7/06, 9/64
U.S. Cl. 382—30 8 Claims



1. A signal processing apparatus for processing a plurality of multi component information signals to produce therefrom a multi component output signal representative of the median value of said plurality of multi component information signals comprising:

a multiplicity N of signal component processing sections each of which comprises:

a plurality of storage register means each of which stores the multiple components of a respective information signal; and

a majority decision circuit, coupled to receive a prescribed one of the componets of each information signal stored in said plurality of storage register means and producing an output signal component representative of the majority of the prescribed ones of the components of each information signal coupled thereto from said storage register means; and wherein

each of the first through $(N-1)^{th}$ processing sections further includes a plurality of control buffer means each of which is coupled to receive the components of a respective information signal stored in a respective one of said plurality of storage register means, and is controlled by the output of the majority decision circuit of that signal processing section to selectively modify the components of the information signal received thereby and couples the selectively modified components to a respective storage register means of the next succeeding stage; and

output register means for storing the output signal components produced by the majority decision circuits of said multiplicity N of processing sections as said multi component output signal.

4,513,441
IMAGE COMPARISON SYSTEM

Philip D. Henshaw, Lexington, Mass., assignor to Sparta, Inc., Lexington, Mass.

Filed Aug. 2, 1983, Ser. No. 519,736
Int. Cl.[3] G01N 21/32; G06K 9/00
U.S. Cl. 382—43 16 Claims

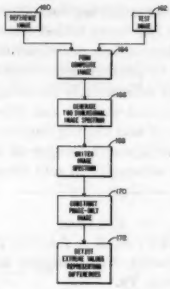
16. An image comparison method comprising:

forming a composite image composed of a reference image and a test image;

generating a two-dimensional image spectrum from said composite image;

whitening said two-dimensional image spectrum by setting the magnitude of every point of the two-dimensional image spectrum to a uniform level;

constructing the phase-only image of the composite image; and



detecting a value of the phase-only image exceeding a predetermined threshold representative of the location of a difference between said reference and test images.

4,513,442

METHOD FOR LOCATING AND CIRCUMSCRIBING TEXT AREAS ON A MASTER WHICH MAY CONTAIN TEXT, GRAPHICS AND/OR IMAGE AREAS

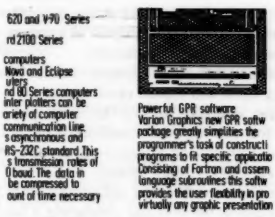
Wolfgang Scherl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,279

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107655

Int. Cl.³ G06K *9/60, 9/34*

U.S. Cl. 382—49 **10 Claims**



1. A method for locating and circumscribing text areas on a master which may contain text, graphics and/or image areas comprising the steps of:

optoelectronically scanning said master for generating analog signals corresponding to an optoelectronic imaging of said master;

converting said analog signals into digital signals by undertaking a decision operation by assigning a first binary number to analog signals representing a white level and assigning a second binary number to analog signals representing a black level;

expanding all points having a black level line-wise by a predetermined multiplier such that a horizontal stroke of predetermined length is respectively generated for each point whereby a black block is generated for each line of text on said master, said black block having a length equal to the length of the line of text plus a predetermined extension length for said black points;

expanding all points remaining after the previous step representing a white level by a predetermined multiplier for expanding said white points in a direction opposite to the expansion of said black points, the expansion of said white points being greater than the expansion of said black points;

extending said black block by a differential length with respect to the original length of the line of text such that a black block extending over the entire line of text is generated;

analyzing said black block with an operator for determining whether horizontal white/black transitions characteristic of text areas exist having a predetermined white column length and a predetermined black column length;

generating a vertical black stroke of predetermined length for every white/black transition such that an isolated black block is generated for each line of text;

listing the left and right extreme coordinates of said black block; and

statistically analyzing said extreme coordinates for said black blocks for determining whether said coordinates are boundaries for a line of text.

4,513,443

RADIO RECEIVER SUITABLE FOR USE IN A SPACED CARRIER AREA COVERAGE SYSTEM

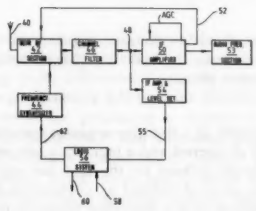
Duncan R. Louttit, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 340,161, Jan. 18, 1982, abandoned. This application May 21, 1984, Ser. No. 612,995

Claims priority, application United Kingdom, Feb. 4, 1981, 8103413

Int. Cl.³ H04B *7/24, 1/26;* **H03J** *7/18*

U.S. Cl. 455—52 **5 Claims**



1. In a method for receiving signals in a spaced carrier area coverage system having at least two transmitters with modulated carrier waves having different carrier frequencies in a given frequency channel, wherein the method includes receiving signals in said channel, mixing said received signals with oscillations of a local oscillator to produce intermediate frequency signals in a given frequency band, and demodulating said intermediate frequency signals to produce output signals; the improvement further comprising the steps of:

a. limiting said intermediate frequency signals to a band width approximately equal to the band width of each one of said modulated carrier waves,

b. determining the signal strengths of each of said limited band width intermediate frequency signals,

c. selectively varying the frequency of said local oscillator to sequentially convert the signals received from said transmitters to the frequency band of said intermediate frequency signals,

d. scanning the signal strengths of each of said limited band width intermediate frequency signals to determine the received signals having the greatest signal strength,

e. adjusting the frequency of said local oscillator to select output signals from said coverage system, said selected output signals corresponding to received signals of the greatest signal strength as determined in d, when the signal strength of at least one of said limited intermediate frequency signals corresponding to at least one transmitter is greater than a first given threshold,

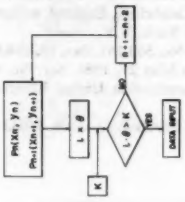
f. determining a second threshold as a function of the strength of the signal determined in d and adjusted to in e,
g. locking the frequency of said local oscillator onto a value so as to lock onto the transmitter signal of greatest strength determined in d until the signal strength of said limited intermediate frequency signal falls below said second threshold, and
h. repeating said steps d–g of scanning, adjusting the frequency of said local oscillator, determining a second threshold and locking, when the signal strength of said limited band width intermediate frequency signal to which said local oscillator has been locked, falls below said second threshold.

4,513,444

METHOD OF COMPRESSING DATA

Tsukasa Okai, and Shuichi Araki, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Jul. 18, 1983, Ser. No. 514,673
Claims priority, application Japan, Sep. 13, 1982, 57-159226
Int. Cl.³ G06K *9/36*
U.S. Cl. 382—56 **4 Claims**



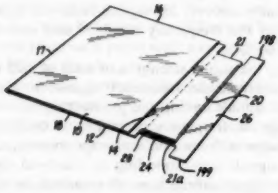
1. A machine method of compressing data derived by tracing the contour line of a character or a graphic symbol, characterized by the steps of:
selecting a plurality of sampling points along the contour line;
finding the length of a first line segment connecting a sampling point of interest and a preceding sampling point;
finding the angle defined by the first line segment and a second line segment defined by connecting the sampling point of interest with a following sampling point; and
determining whether the sampling point of interest is necessary data which needs to be retained or unnecessary data which may be disregarded according to the length of the first line segment and the angle defined by the first and the second line segments.

4,513,445

ADHESIVE CLOSURE BAGS AND METHOD FOR PRODUCING SAME

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 27, 1982, Ser. No. 453,170
Int. Cl.³ B65D *33/00*
U.S. Cl. 383—87 **5 Claims**



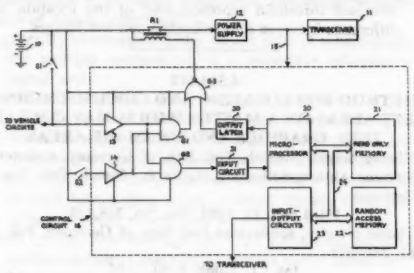
1. A bag which comprises a front wall member and a rear wall member, joined together at three edges to form a bag having an open bag mouth, a closure flap extending from said rear wall member beyond said bag mouth and adapted to be drawn over said bag mouth and into contact with said front wall member in order to close the bag, and an adhesive applied to said closure flap for adhering said flap to said front wall member, said closure flap being folded upon itself into a Z-fold with said adhesive disposed on one superimposed portion and releasably adhering to another superimposed portion of the Z-folded flap, thereby substantially covering said adhesive and protecting it from contact with air and other exterior objects, and at least a portion of said closure flap having a width that is less than the bag width and the edges of said flap being unsealed except by the adherence of said adhesive.

4,513,446

CONTROL CIRCUIT FOR A RADIO TRANSCEIVER

Samuel A. Leslie, Forest, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Feb. 9, 1983, Ser. No. 465,164
Int. Cl.³ H04B *1/38*
U.S. Cl. 455—73 **4 Claims**



1. A control circuit for a radio transceiver comprising:
a. a vehicular ignition switch coupled to a power source and having open and closed conditions;
b. a transceiver on-off switch coupled to said power source and having open and closed conditions;
c. first means coupled to said ignition and transceiver switches for sensing the conditions of both of said switches and producing a power-on signal in response to both said conditions being sensed;
d. second means coupled to said radio transceiver for sensing a communication thereon and producing a latch signal in response to and for the duration of said communication;
e. and third means coupled to said first means and to said second means for supplying power to said radio transceiver from said power source in response to said power-on signal or in response to said latch signal, or in response to both said power-on signal and said latch signal, said third means continue to supply power to said transceiver in response to and for the duration of said latch signal, despite the absence of said power-on signal.

4,513,447

SIMPLIFIED FREQUENCY SCHEME FOR COHERENT TRANSPONDERS

Lansing M. Carson, Temple, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 13, 1982, Ser. No. 449,344
Int. Cl.³ H04B *1/40, 1/59*
U.S. Cl. 455—76 **9 Claims**

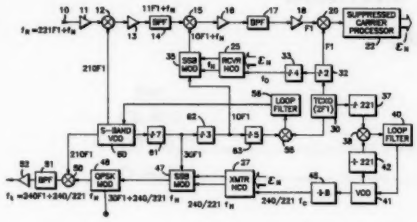
1. A coherent transponder for a communications system, including a transmitter and a receiver operating at different frequencies, comprising:
a first numerically controlled oscillator coupled to the re-

ceiver for controlling the operating frequency in at least a portion thereof;

a second numerically controlled oscillator coupled to the transmitter for controlling the operating frequency in at least a portion thereof;

a fixed frequency source;

a means for comparing the controlled operating frequency of the receiver to a predetermined frequency derived from



said fixed frequency source and providing a digital frequency control word representative of any error in the controlled operating frequency;

means coupling clock signals from said fixed frequency source and the frequency control word to said first and second numerically controlled oscillators for controlling said first and second numerically controlled oscillators to provide the different operating frequencies in the transmitter and receiver while maintaining coherence.

4,513,448

LOW POWER RADIO SYNTHESIZER WITH HARMONIC IDENTIFICATION FEATURE

Robert A. Maher, Carrollton, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 12, 1983, Ser. No. 522,949

Int. Cl.[3] **H04B** *1/16;* **H03L** *7/20*

U.S. Cl. 455—265 **6 Claims**

1. A channelized radio synthesizer comprising, in combination:

a. phase-lock loop means for locking to any one of a plurality of carrier frequencies, said phase-lock loop means comprising;

a voltage controlled oscillator for producing a preselected desired output carrier frequency corresponding to any one of a first plurality of harmonics of a reference signal;

a summer connected to apply to said voltage controlled oscillator a voltage summed from a first voltage and a second voltage;

a loop filter for producing said first voltage to be applied to said summer;

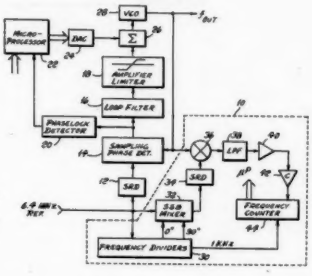
means for producing a first plurality of harmonics of a reference signal;

a sampling phase detector connected in circuit between the voltage controlled oscillator output and the phase loop filter input for receiving a harmonic of said first plurality of harmonics;

b. harmonic identification means comprising;

means for producing a second plurality of harmonics of a second signal offset in frequency slightly from said reference signal;

a mixer with an input signal combination of the preselected



desired output carrier frequency and a harmonic from said second plurality of harmonics, and an output signal corresponding to the difference frequency between said input signal combination;

counter means for producing a difference measurement signal representative of said difference frequency;

c. a microprocessor connected to receive said difference measurement signal from said counter means and the output of said sampling phase detector; and

d. a digital to analog converter having an input connected to the output of the microprocessor for providing said second voltage and connected to apply said second voltage to said summer,

said second voltage having a magnitude effective to change the output frequency of said voltage controlled oscillator in a direction towards said preselected desired output.

DESIGN PATENTS

GRANTED APR. 23, 1985

ERRATA

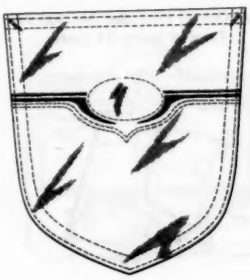
For CLASS	See PATENT NO.
D07–027	278,470
D06–309	278,558

DESIGNS

APRIL 23, 1985

278,470
CALF GUARD
Lars Eghamn, Repslagarvägen 24, S-852 34 Sundsvall, Sweden
Filed Sep. 27, 1982, Ser. No. 425,125
Claims priority, application Sweden, Jun. 28, 1982, 82-1689
Term of patent 14 years
U.S. Cl. D2—27

278,471
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,645
Term of patent 14 years
U.S. Cl. D2—28



278,472
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,343
Term of patent 14 years
U.S. Cl. D2—40

278,473
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,641
Term of patent 14 years
U.S. Cl. D2—40

278,474
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,642
Term of patent 14 years
U.S. Cl. D2—40

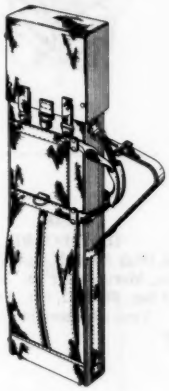
278,475
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,644
Term of patent 14 years
U.S. Cl. D2—40

278,476
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,645
Term of patent 14 years
U.S. Cl. D2—41

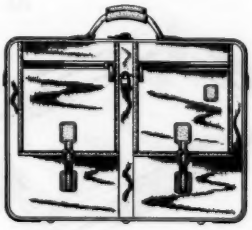
278,477
SHIRT
Masao Mizuno, 15-7, Nishiki 2-Chome, Naka-ku, Nagoya City, Aichi Prefecture, Japan
Filed Apr. 9, 1982, Ser. No. 367,190
Term of patent 14 years
U.S. Cl. D2—208

278,478
INSULATED SKI BOOT JACKET
Lorane K. Reecher, 38 Da Vinci, Lake Oswego, Oreg. 97034, and Sharman Reecher, 4085 Sugar Maple Dr., Danville, Calif. 94526
Filed Oct. 4, 1982, Ser. No. 435,928
Term of patent 14 years
U.S. Cl. D2—267

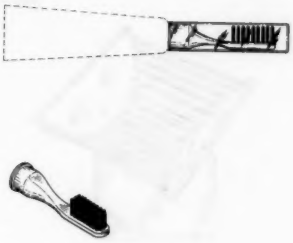
278,479
GOLF BAG
Ernest Bevilacqua, Wilton, Conn., and Theodore Knerr, New York, N.Y., assignors to Bost Enterprises, Inc., Norwalk, Conn.
Filed Mar. 22, 1983, Ser. No. 477,738
Term of patent 14 years
U.S. Cl. D3—37



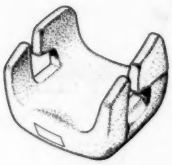
278,480
LUGGAGE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed Oct. 21, 1982, Ser. No. 435,810
Term of patent 14 years
U.S. Cl. D3—71



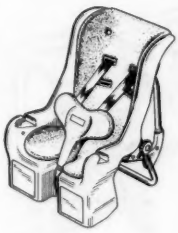
278,481
COMBINATION TOOTHBRUSH AND COVER THEREOF
Earl N. Ditgen, Rte. #1, Nickerson, Kans. 67561
Filed Mar. 29, 1982, Ser. No. 363,258
Term of patent 14 years
U.S. Cl. D4—104



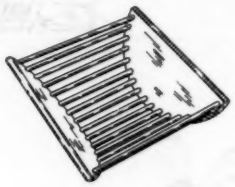
278,482
CHILD SAFETY SEAT FOR VEHICLES
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan
Filed Jan. 7, 1983, Ser. No. 456,417
Term of patent 14 years
U.S. Cl. D6—333



278,483
CHILD SAFETY SEAT FOR VEHICLES
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan
Filed Jan. 7, 1983, Ser. No. 456,415
Term of patent 14 years
U.S. Cl. D6—333



278,484
CHILD'S ROCKER
Christopher Duderstadt, 1327 10th Ave., San Francisco, Calif. 94122
Filed Jan. 13, 1983, Ser. No. 457,767
Term of patent 14 years
U.S. Cl. D6—348

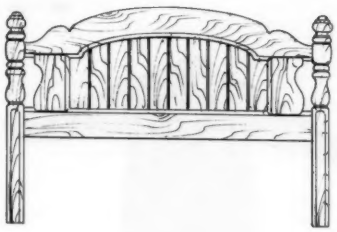


278,485
CHAIR
Edmund E. Ely, 2302 Wesleyan Ct., Louisville, Ky. 40222
Filed Oct. 27, 1982, Ser. No. 436,940
Term of patent 14 years
U.S. Cl. D6—365

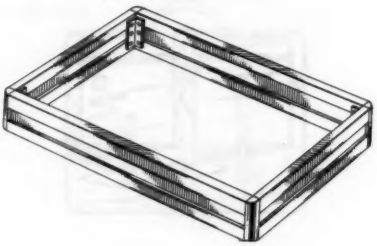
278,486
FOLDABLE CHAIR OR THE LIKE
Peter K. Bayly, Kangaroo Ground, Australia, assignor to Roplas Pty. Ltd., Victoria, Australia
Filed Jan. 28, 1983, Ser. No. 462,086
Claims priority, application Australia, Aug. 4, 1982, 1154/82
Term of patent 14 years
U.S. Cl. D6—368

278,487
CHAIR
Bobby J. Welsh, Shelbyville, Ind., assignor to Hickory Furniture Works, Inc., Shelbyville, Ind.
Filed Oct. 12, 1982, Ser. No. 433,830
Term of patent 14 years
U.S. Cl. D6—369

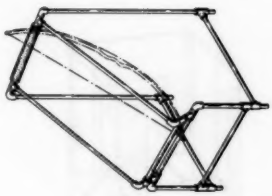
278,488
HEADBOARD
Haywood L. West, High Point, N.C., assignor to Hooker Furniture Corporation, Martinsville, Va.
Filed Sep. 13, 1982, Ser. No. 417,106
Term of patent 14 years
U.S. Cl. D6—508

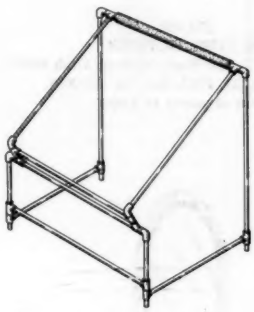


278,489
WATER BED FRAME
Larry L. Ragland, P.O. Box 6691, Phoenix, Ariz. 85005
Filed Sep. 29, 1982, Ser. No. 427,800
Term of patent 14 years
U.S. Cl. D6—382

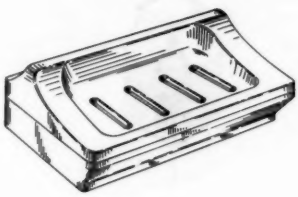


278,490
BOW RACK
Charles R. Stevens, Rte. 3, Box 395, Poplarville, Miss. 39470
Filed Aug. 23, 1982, Ser. No. 410,608
Term of patent 14 years
U.S. Cl. D6—462

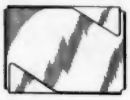


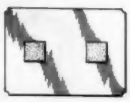


278,491
SOAP HOLDER
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Filed Nov. 1, 1982, Ser. No. 438,338
Claims priority, application Austria, May 5, 1982, 303/82
Term of patent 14 years
U.S. Cl. D6—536

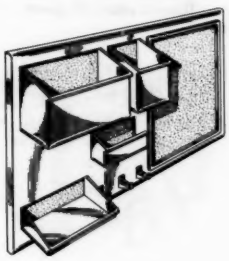


278,492
TISSUE DISPENSER
Walter R. Short, Barry, Wales, assignor to Rizla Limited, Mid-Glamorgan, Wales
Filed Mar. 11, 1983, Ser. No. 474,308
Claims priority, application United Kingdom, Sep. 13, 1982, 1008690
Term of patent 14 years
U.S. Cl. D6—518

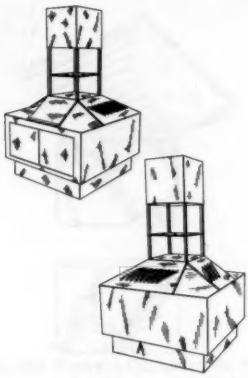




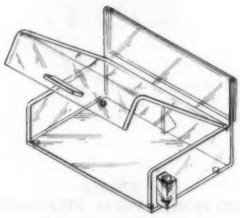
278,493
COMBINED HORIZONTAL STORAGE UNIT AND DISPLAY BOARD
Anthony Brescia, Liverpool, and Ross Deacon, Syracuse, both of N.Y., assignors to Syroco Inc., Syracuse, N.Y.
Filed Jun. 16, 1982, Ser. No. 388,915
Term of patent 14 years
U.S. Cl. D6—570



278,494
DISPLAY UNIT FOR CHINA AND CRYSTAL OR THE LIKE
Darrell McCluhan, Kansas City, Mo., assignor to Celebrity China Company, Lenexa, Kans.
Filed Jul. 6, 1982, Ser. No. 395,316
Term of patent 14 years
U.S. Cl. D6—436

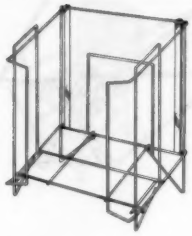


278,495
DISPLAY CASE
Milton S. Rattner, 180 E. End Ave., New York, N.Y. 10023
Filed Jul. 6, 1982, Ser. No. 395,827
Term of patent 14 years
U.S. Cl. D6—470



278,496
EASEL FOR PRONE INDIVIDUAL
Marcian C. Hausman, R.R. 3, Tuscola, Ill. 61953
Filed Aug. 4, 1982, Ser. No. 405,710
Term of patent 14 years
U.S. Cl. D6—310

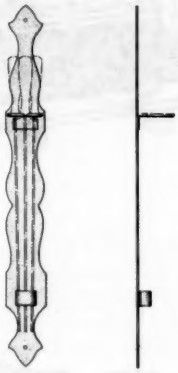
278,497
PILLOW RACK
Arline Walpin, 9400 Brighton Way, Beverly Hills, Calif. 90210
Filed Aug. 17, 1982, Ser. No. 408,804
Term of patent 14 years
U.S. Cl. D6—462



278,498
PICTURE HOLDER
Betty J. Corley, 6414 S. 990 West, Murray, Utah 84107
Filed Aug. 23, 1982, Ser. No. 410,846
Term of patent 14 years
U.S. Cl. D6—309

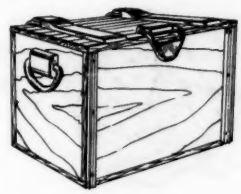
278,499
COMBINED RECORD CARROUSEL AND STORAGE UNIT
Walter Shannon, 8037 Champagne Dr., Stockton, Calif. 95210
Filed Sep. 14, 1982, Ser. No. 418,052
Term of patent 14 years
U.S. Cl. D6—407

278,500
BARBEQUE SKEWER RACK
George A. Rafferty, Sr., 1400 NW. 46th St., Gainesville, Fla. 32605
Filed Aug. 16, 1982, Ser. No. 408,213
Term of patent 14 years
U.S. Cl. D6—572



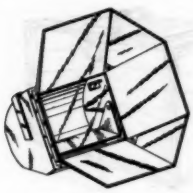
278,501
BOWL CARRIER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Sep. 7, 1982, Ser. No. 415,497
Term of patent 14 years
U.S. Cl. D7—19

278,502
COOLER BOX
Edward A. Powell, Jr., Richmond, Va., assignor to Miller Manufcturing Company, Richmond, Va.
Filed Aug. 19, 1982, Ser. No. 409,568
Term of patent 14 years
U.S. Cl. D7—77

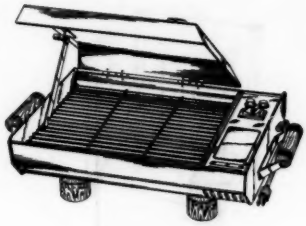


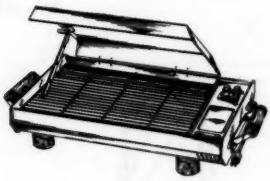
278,503
BOTTLED LIQUID DISPENSER
Gabor Kadar, 4635 White Oak Ave., Encino, Calif. 91316
Filed Sep. 20, 1982, Ser. No. 419,839
Term of patent 14 years
U.S. Cl. D7—301

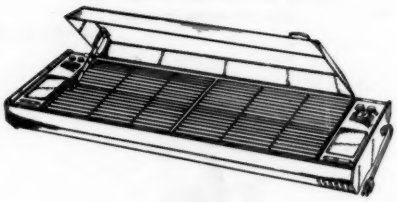
278,504
PORTABLE SOLAR OVEN
Bojan Jerman, Ljubljana, Yugoslavia, assignor to Gorenje- Tiki, Elektro Strojno Podjetje, p.o., Ljubljana, Yugoslavia
Filed Feb. 26, 1982, Ser. No. 352,561
Claims priority, application Yugoslavia, Aug. 28, 1981, M-307/81
Term of patent 14 years
U.S. Cl. D7—324



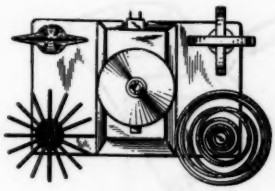
278,505
PORTABLE BARBECUE GRILL
Edward H. Mackin, Fair Haven, N.J., assignor to Maverick Industries, Inc., Union, N.J.
Filed Jul. 26, 1982, Ser. No. 401,849
Term of patent 14 years
U.S. Cl. D7—337

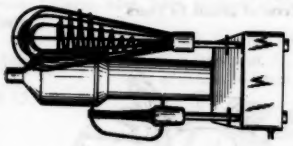




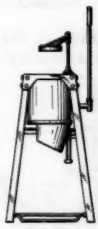


278,506
KITCHEN APPLIANCE
Barbara Kafka, 23 E. 92nd St., New York, N.Y. 10028
Filed Sep. 7, 1982, Ser. No. 415,265
Term of patent 14 years
U.S. Cl. D7—376

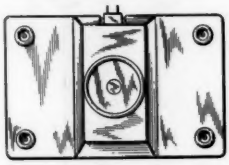


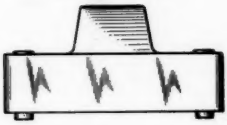


278,507
PINEAPPLE CUTTER
Kashichi Mori, Iwatsuki, Japan, assignor to Kowa Shoji Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 16, 1982, Ser. No. 349,110
Claims priority, application Japan, Aug. 20, 1981, 56-36308
Term of patent 14 years
U.S. Cl. D7—381



278,508
KITCHEN APPLIANCE BASE
Barbara P. Kafka, 23 E. 92nd St., New York, N.Y. 10028
Filed Sep. 7, 1982, Ser. No. 415,266
Term of patent 14 years
U.S. Cl. D7—386



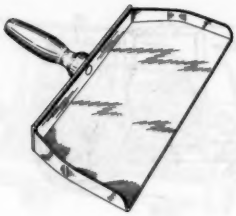


278,509
BOTTLE CAP OPENER
Gary C. Middleton, and Kenneth R. Smith, both of Middleville, Mich., assignors to Middleville Tool & Die Co., Middleville, Mich.
Filed Jul. 8, 1982, Ser. No. 396,348
Term of patent 14 years
U.S. Cl. D8—18

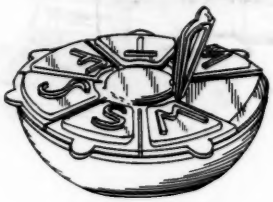
278,510
WRENCH
Allan Schoeberlein, 235 Ashland, Aurora, Ill. 60505
Filed May 27, 1982, Ser. No. 382,626
Term of patent 14 years
U.S. Cl. D8—28

278,511
HAND SEAMER TOOL FOR STANDING SEAM ROOFS
Warren D. Smith, P.O. Box 3124, South Bend, Ind. 46619
Filed Jul. 15, 1982, Ser. No. 398,768
Term of patent 14 years
U.S. Cl. D8—52

278,512
HOLDER FOR SPACKLE
Jozef Lojko, 101 Nassau Ave., Brooklyn, N.Y. 11222
Filed Jul. 1, 1982, Ser. No. 394,264
Term of patent 14 years
U.S. Cl. D8—71

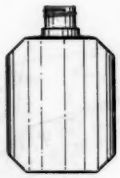


278,513
COMPARTMENTED PILL CONTAINER
Wade M. Ebeling, 1017 Beecher Ave., Brigham City, Utah 84302, and Arnold A. Thayer, 1415 Highland Dr., Logan, Utah 84321
Filed May 5, 1982, Ser. No. 374,982
Term of patent 14 years
U.S. Cl. D9—339

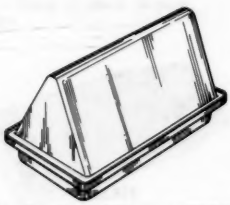


278,514
PACKAGING CONTAINER
Ronald K. Moore, Kempsey, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England
Filed Jun. 22, 1982, Ser. No. 390,975
Claims priority, application United Kingdom, Jan. 8, 1982, 1004522
Term of patent 14 years
U.S. Cl. D9—341

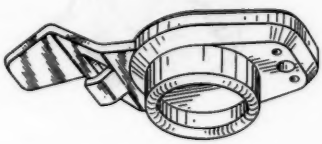
278,515
BOTTLE
Bert G. Adams, Norwalk, Conn., and Patrick J. Manna, New Rochelle, N.Y., assignors to Economics Laboratory, Inc., St. Paul, Minn.
Filed Jun. 29, 1982, Ser. No. 393,438
Term of patent 14 years
U.S. Cl. D9—403



278,516
CONTAINER FOR FOOD PRODUCTS
Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy
Filed Jan. 7, 1983, Ser. No. 456,505
Claims priority, application Italy, Jul. 21, 1982, 53548/82[U]
Term of patent 14 years
U.S. Cl. D9—425

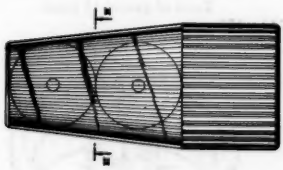


278,517
COMBINED BOTTLE TOP AND BOTTLE OPENER
Ivan Milin, 4 Hill Crescent, Scarborough, Ontario, Canada M1M 3T6
Filed Feb. 16, 1983, Ser. No. 466,829
Term of patent 14 years
U.S. Cl. D9—437



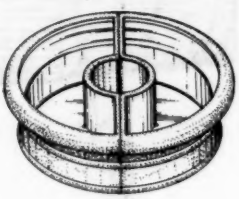
278,518
WRISTWATCH
Gilbert Kervan, Geneva, Switzerland, assignor to Ateliers Reunis S.A., Geneva, Switzerland
Filed Jan. 19, 1983, Ser. No. 459,097
Term of patent 14 years
U.S. Cl. D10—32

278,519
SAFETY LIGHT
Samuel C. Caldwell, Burke, Va., assignor to Caldwell Corporation, Burke, Va.
Filed Aug. 2, 1982, Ser. No. 404,479
Term of patent 14 years
U.S. Cl. D10—114

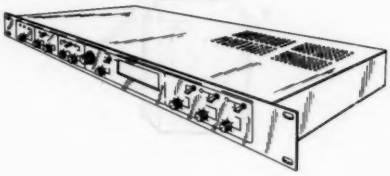


278,520
MULTIFUNCTION NECKLACE CONTAINER
Frank Hamtak, 11817 - 218th Ave., Bristol, Wis. 53104
Filed Sep. 27, 1982, Ser. No. 424,542
Term of patent 14 years
U.S. Cl. D11—2

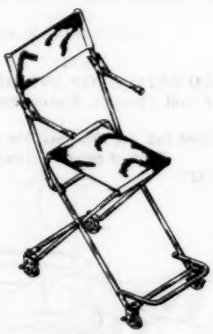
278,521
TWO PART FLOWER CONTAINER
Robert W. Baird, 3580 W. Loma Linda, Fresno, Calif. 93711, and Patricia Hopper, 556 E. Pontiac Way, Fresno, Calif. 93704
Filed Jul. 25, 1983, Ser. No. 517,239
Term of patent 14 years
U.S. Cl. D11—153



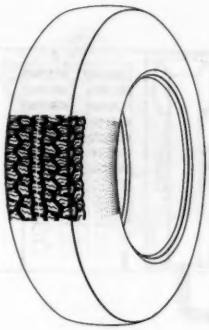
278,522
ELECTRONIC CIRCUIT CONTROL RACK MODULE
Gary A. Hardesty, 1000 SE. Bertelsen Rd., Suite 4, Eugene, Oreg. 97402
Filed May 3, 1982, Ser. No. 373,841
Term of patent 14 years
U.S. Cl. D13—12



278,523
WHEELED FOLDING CHAIR
A. Lester Tuley, 6381 San Andres Ave., Atascadero, Calif. 93422
Filed Aug. 9, 1982, Ser. No. 406,392
Term of patent 14 years
U.S. Cl. D12—131



278,524
TIRE
Joseph F. Molnar, Wadsworth, and Bill J. Wallet, Marshallville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jul. 11, 1983, Ser. No. 512,260
Term of patent 14 years
U.S. Cl. D12—147



278,525
FLOOR MAT FOR A VEHICLE
Janusz Morawski, P.O. Box 562, Station "P", Toronto, Ontario, Canada
Filed Apr. 23, 1981, Ser. No. 256,721
Claims priority, application Canada, Oct. 27, 1980, 27-10-80-8; Nov. 5, 1980, 05-11-80-5
Term of patent 14 years
U.S. Cl. D12—203

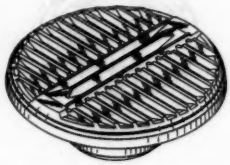
278,526
VEHICLE WHEEL
Giorgetto Giugiaro, Turin, Italy, assignor to Nihom Melber Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1982, Ser. No. 449,185
Term of patent 14 years
U.S. Cl. D12—204

278,527
VEHICLE WHEEL
Giorgetto Giugiaro, Turin, Italy, assignor to Nihon Melber Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1982, Ser. No. 449,510
Term of patent 14 years
U.S. Cl. D12—204

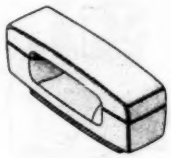
278,528
ELECTRIC MOTOR
Mario H. Gottfried, Holonda #3, Coyoacan OY21, Mexico, D.F., Mexico
Filed Dec. 8, 1982, Ser. No. 447,924
Term of patent 14 years
U.S. Cl. D13—1

278,529
SECURITY LIGHT SWITCH WITH BUILT-IN TIME DISPLAY AND ON/OFF SWITCH OR A SIMILAR ARTICLE
Richard L. Hoogner, Sunnyvale, Calif., assignor to Security Switch, Ltd., San Ramon, Calif.
Filed May 14, 1982, Ser. No. 378,442
Term of patent 14 years
U.S. Cl. D13—32

278,530
LOUDSPEAKER
You Takagi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Aug. 9, 1982, Ser. No. 406,160
Claims priority, application Japan, Mar. 4, 1982, 57-8880
Term of patent 14 years
U.S. Cl. D14—30

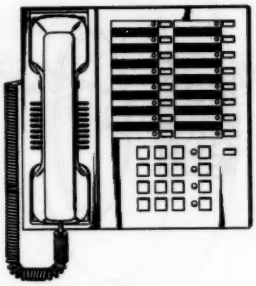


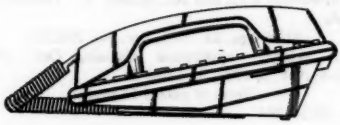
278,531
HOUSING FOR A TELEPHONE OR SIMILAR ARTICLE
John N. McGarvey, Drexel Hill, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Jul. 19, 1984, Ser. No. 632,187
Term of patent 14 years
U.S. Cl. D14—53



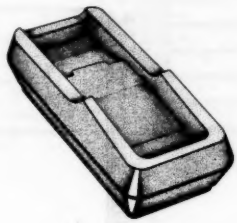
278,532
TELEPHONE
Denni F. Rivette, and Rouben T. Terzian, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 13, 1982, Ser. No. 449,139
Term of patent 14 years
U.S. Cl. D14—53

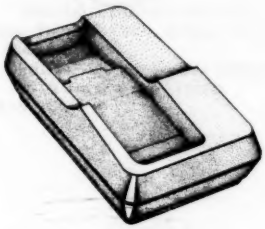
278,533
TELEPHONE
Tetsuro Ando, Tokyo, Japan, assignor to KabushikiKaisha Taikodenki Seisakusho, Tokyo, Japan
Filed Jun. 17, 1982, Ser. No. 389,379
Claims priority, application Japan, Dec. 18, 1981, 56-56292
Term of patent 14 years
U.S. Cl. D14—53



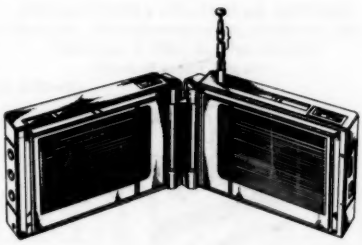


278,534
TELEPHONE STAND
Thomas B. Aldrich, Spring Valley; John Pardo, Yonkers, and Martin H. Snyder, New York, all of N.Y., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Jul. 19, 1984, Ser. No. 632,185
Term of patent 14 years
U.S. Cl. D14—60

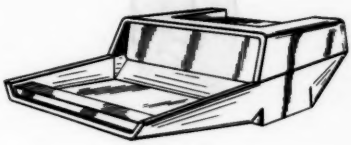




278,535
AM/FM FOLDABLE RADIO
Vinod S. Sujanani, Aberdeen, Hong Kong, assignor to Vhoom Systems Limited, Hong Kong, Hong Kong
Filed Sep. 28, 1982, Ser. No. 425,465
Claims priority, application United Kingdom, Aug. 13, 1982, 1008298
Term of patent 14 years
U.S. Cl. D14—68



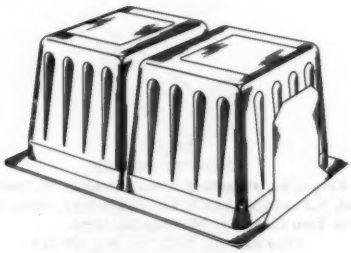
278,536
CONSOLE FOR A DATA TERMINAL
Terence T. Caven, Beeston, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Apr. 28, 1982, Ser. No. 372,711
Claims priority, application United Kingdom, Oct. 28, 1981, 1003269
Term of patent 14 years
U.S. Cl. D14—106



278,537
SNOW THROWER
Jacob Krapowicz, Ridgefield, Conn.; Douglas W. Smith, Belle Mead, N.J., and Michael E. Laude, Danbury, Conn., assignors to The Toro Company, Minneapolis, Minn.
Filed Apr. 29, 1983, Ser. No. 489,916
Term of patent 14 years
U.S. Cl. D15—12

278,538
PUMP AND OIL RESERVOIR HOUSING FOR A SEWING MACHINE OR THE LIKE
Versell H. Schroeder, Blaine; Alton H. Sterling, Prior Lake, and Josef H. Rozenberg, St. Louis Park, all of Minn., assignors to AXIA Incorporated, Minneapolis, Minn.
Filed Jun. 1, 1982, Ser. No. 382,787
Term of patent 14 years
U.S. Cl. D15—72

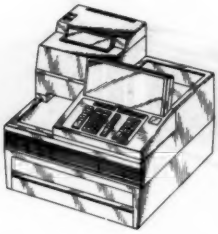
278,539
TONER CARTRIDGE
Paul J. Josephson, and Larry W. Lykins, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 9, 1983, Ser. No. 530,920
Term of patent 14 years
U.S. Cl. D16—32



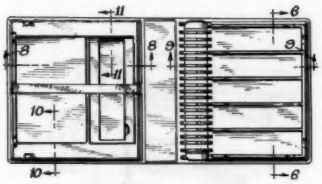
278,540
CLARINET THUMB REST
Charles Morris, 709 Eastside Blvd., Muskogee, Okla. 74401
Filed Aug. 13, 1982, Ser. No. 407,710
Term of patent 14 years
U.S. Cl. D17—13

278,541
ELECTRICAL GUITAR
John J. Toth, Fairfield, Conn., assignor to Richelieu Electrics Corp., Bridgeport, Conn.
Filed Sep. 27, 1982, Ser. No. 424,451
Term of patent 14 years
U.S. Cl. D17—14

278,542
POINT OF SALE TERMINAL
Yoshinori Kakiuchi, Yokohama, and Masami Watari, Hatano, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 2, 1982, Ser. No. 438,694
Claims priority, application Japan, Jun. 22, 1982, 57-27800
Term of patent 14 years
U.S. Cl. D18—4



278,543
DISPLAY NOTEBOOK
Richard A. Gintz, 4465 Caminito Ocio, San Diego, Calif. 92108
Filed Sep. 29, 1982, Ser. No. 427,354
Term of patent 14 years
U.S. Cl. D19—27



278,544
MESSAGE MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., New Rochelle, N.Y.
Filed Jan. 20, 1983, Ser. No. 459,629
Term of patent 14 years
U.S. Cl. D19—91

278,545
DECALOMANIA OR SIMILAR ARTICLE
Karl G. Byrd, Sr., 3812 Barrington Rd., Baltimore, Md. 21215
Filed Apr. 2, 1982, Ser. No. 364,630
Term of patent 14 years
U.S. Cl. D20—11

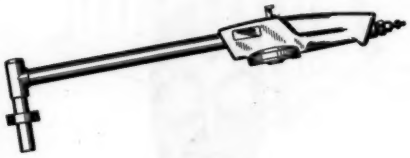
278,546
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982,. This application Jun. 29, 1984, Ser. No. 626,328
Term of patent 14 years
U.S. Cl. D21—190

278,547
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982,. This application Jun. 29, 1984, Ser. No. 626,539
Term of patent 14 years
U.S. Cl. D21—190

278,548
PHYSICAL EXERCISER
Dixie C. Backstrom, 5 Park Ave., Yale, Mich. 48097
Filed Dec. 17, 1982, Ser. No. 433,692
Term of patent 14 years
U.S. Cl. D21—191

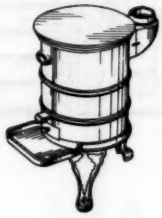
278,549
CAGE-SHAPED SWING
John Kristich, Port Charlotte, Fla., assignor to Kristy Creations, Inc., Warren, Ohio
Filed Jan. 20, 1982, Ser. No. 340,982
Term of patent 14 years
U.S. Cl. D21—246

278,550
AUTOMATIC BATTERY WATER FILLER
Cecil G. Blank, Toledo, Ohio, assignor to Flow Systems, Toledo, Ohio
Filed Feb. 8, 1982, Ser. No. 346,903
Term of patent 14 years
U.S. Cl. D23—17

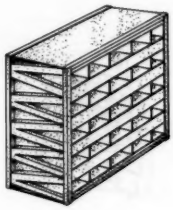


278,551
RELIEF VALVE
Ray Crossman, 2796 Wissemann Dr., Sacramento, Calif. 95826
Filed May 19, 1982, Ser. No. 379,728
Term of patent 14 years
U.S. Cl. D23—19

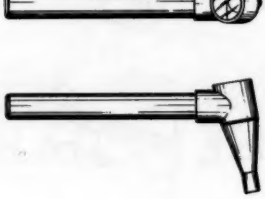
278,552
STOVE
Oreste G. Nosenzo, Asti, Italy, assignor to C.S. di NOSENZO Oreste, Asti, Italy
Filed Dec. 7, 1982, Ser. No. 447,552
Claims priority, application Italy, Apr. 3, 1981, 53079/81[U]
Term of patent 14 years
U.S. Cl. D23—97



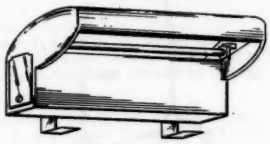
278,553
HIGH-EFFICIENT CHARCOAL FILTER OR THE LIKE
John L. Cherry, Washington, N.C., assignor to Charcoal Service Corporation, Bath, N.C.
Filed May 28, 1982, Ser. No. 383,283
Term of patent 14 years
U.S. Cl. D23—149



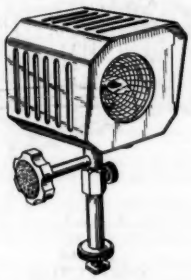
278,554
OTOSCOPE
Leroy D. Bain, Alpine, and Murray J. Risch, San Diego, both of Calif., assignors to B and B Marketing and Development Inc., San Diego, Calif.
Filed Sep. 2, 1982, Ser. No. 414,025
Term of patent 14 years
U.S. Cl. D24—17



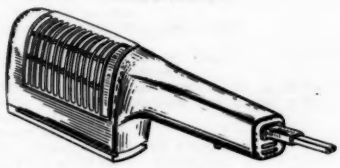
278,555
PICTURE LAMP
Jack D. Cummings, 10519 Monogram Ave., Granada Hills, Calif. 91344
Filed Nov. 20, 1982, Ser. No. 441,920
Term of patent 14 years
U.S. Cl. D26—60



278,556
SPOTLIGHT FOR VIDEO CAMERA
Kenneth L. Rubel, 300 W. Hill, Apt. 916, Chicago, Ill. 60610
Filed Sep. 30, 1982, Ser. No. 429,438
Term of patent 14 years
U.S. Cl. D26—63

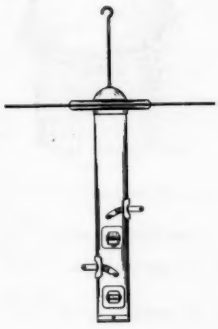


278,557
STYLER DRYER
Witold Pajak, Wayne, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Apr. 27, 1983, Ser. No. 489,196
Term of patent 14 years
U.S. Cl. D28—13



278,558
COVERED VANITY MIRROR
John E. Shenken, and Charles A. Haas, both of 420 E. Grand St., Des Moines, Iowa 50309
Filed Aug. 12, 1982, Ser. No. 412,559
Term of patent 14 years
U.S. Cl. D6—309

278,559
BIRD FEEDER
Peter A. Latham, Rye, NH, and Peter J. Sabean, Braintree, Mass., assignors to Opus, Inc., Framingham, Mass.
Filed Jan. 4, 1983, Ser. No. 455,602
Term of patent 14 years
U.S. Cl. D30—15

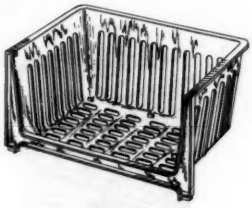


278,560
COMBINED SUCTION CLEANER UPPER HOUSING AND BAG OR THE LIKE
Richard A. Wareham, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Jun. 10, 1982, Ser. No. 387,175
Term of patent 14 years
U.S. Cl. D32—22

278,561
CONTAINER
George C. Anderson, Mount Prospect, Ill., assignor to Insilco Corporation, Wheeling, Ill.
Filed Sep. 13, 1982, Ser. No. 417,018
Term of patent 14 years
U.S. Cl. D32—53

278,562
MOBILE STORAGE RACK FOR TRAY TABLES
Norbert L. Cwik, Northfield, Ill., assignor to Quaker Industries, Inc., Antioch, Ill.
Filed Apr. 26, 1982, Ser. No. 371,947
Term of patent 14 years
U.S. Cl. D34—26

278,563
COMBINED STACKABLE AND NESTABLE BIN
Robert T. Howitt, Leominster, Mass., assignor to Frem Corporation, Worcester, Mass.
Filed Sep. 29, 1982, Ser. No. 427,170
Term of patent 14 years
U.S. Cl. D34—40



278,564
CARPET TILE
Harold Reuben, Akron, Ohio, assignor to The Akro Corporation, Canton, Ohio
Filed Sep. 30, 1982, Ser. No. 431,139
Term of patent 14 years
U.S. Cl. D92—25

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Harvestore Products, Inc.: *See*—
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A. Stucki Company: *See*—
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Aalbers, Vas J., to Heineken Technisch Beheer, B.V. Preparation of malt and beer having a low nitrosamine content. 4,513,013, Cl. 426-16.000.

AB Vacuum-Extractor: *See*—
Uddenberg, Goran O., 4,512,347, Cl. 128-352.000.

Abbas, Shakir A.; and Magdo, Ingrid E., to International Business Machines Corporation. Self-aligned metal field effect transistor integrated circuit. 4,513,303, Cl. 357-23.300.

Abbey, Kirk J.; Erickson, James R.; and Kunz, Barbara L., to SCM Corporation. Cathodic electrocoating composition compounded with latex binder. 4,512,860, Cl. 204-181.00C.

Abbott, James B.; Kohn, Ernest O.; Berry, Christopher; and Slade, Mark N., to Metal Box plc. Method of forming flanged containers. 4,512,172, Cl. 72-68.000.

Abe, Michio; Maeda, Naoyuki; and Lynas, Robert M., to Tokai TRW & Co. Ltd. Rotation detecting apparatus. 4,512,367, Cl. 137-554.000.

Abe, Seiko: *See*—
Igashira, Toshihiko; Kawai, Hisasi; Tanaka, Takeshi; Iwamoto, Kenzi; Abe, Seiko; and Hashimoto, Eiji, 4,512,307, Cl. 123-383.000.

Abe, Shinichi; Taura, Mitsuharu; Amano, Hidetoshi; and Mizuno, Toshiaki, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Method of and device for controlling fuel injection in internal combustion engine. 4,512,320, Cl. 123-492.000.

Abe, Yoichi: *See*—
Matsumoto, Hajime; and Abe, Yoichi, 4,512,748, Cl. 446-354.000.

Abel, William E., to Sentrol, Inc. Housing for an electronic circuit board. 4,513,354, Cl. 361-399.000.

Abele, Gunter, to Machinefabriek G. J. Nijhuis B.V. Apparatus for unhairing slaughtered livestock. 4,512,058, Cl. 17-20.000.

Ableidinger, Bruce J.: *See*—
Henry, Michael D.; Ableidinger, Bruce J.; and Agarwal, Nirmal K., 4,513,395, Cl. 364-900.000.

Abu-Moustafa, Magda: *See*—
Valayil, Silvester; Abu-Moustafa, Magda; and Benjamin, Terry A., 4,512,818, Cl. 148-6.14R.

Abys, Joseph A.; and Okinaka, Yutaka, to AT&T Bell Laboratories. Palladium compound synthesis procedure. 4,512,963, Cl. 423-387.000.

ACF Industries, Inc.: *See*—
Tansuwan, Chusak, 4,512,309, Cl. 123-425.000.

Ackermann, Albert B.; Jones, Donald K.; and Holey, Timothy M., to Boeing Company, The. Escape slide deployment system. 4,512,539, Cl. 244-137.00P.

Acklam, Donald J.; Bird, David; and Hill, Graham A., to British Aerospace Public Limited Company. Control apparatus. 4,513,235, Cl. 318-685.000.

Acme Engineering & Manufacturing Corp.: *See*—
Bohanon, Hoy R., Sr., 4,512,242, Cl. 98-31.500.

Acorn Engineering Company: *See*—
Morris, Earl L.; and Hafner, V. Walter, 4,512,241, Cl. 98-32.000.

Adam-Molina, Solange; and Hofheinz, Werner, to Hoffmann-La Roche Inc. Method of inhibiting β-lactamase forming pathogens. 4,512,999, Cl. 514-192.000.

Adams, Ladd M.: *See*—
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Addamiano, Arrigo; and Klein, Philipp H., to United States of America, Navy. Recovery of fragile layers produced on substrates by chemical vapor deposition. 4,512,825, Cl. 148-175.000.

Adlhart, Otto J., to Engelhard Corporation. Hydrogen generator. 4,513,065, Cl. 429-19.000.

Adolphi, Heinrich: *See*—
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,512,984, Cl. 514-147.000.

Adsorbent Products Inc.: *See*—
Goldman, Max, 4,512,245, Cl. 98-115.400.

Agarwal, Nirmal K.: *See*—
Henry, Michael D.; Ableidinger, Bruce J.; and Agarwal, Nirmal K., 4,513,395, Cl. 364-900.000.

Agbay, Albert J.; and Thomas, Ralph H., Sr., to Robert Linkletter Associates, Inc. Tamper resistant and tamper evident closures. 4,512,485, Cl. 215-225.000.

Agfa-Gevaert AG: *See*—
Helling, Gunter, 4,513,080, Cl. 430-537.000.
Hosel, Peter, 4,512,704, Cl. 414-292.000.

Aichi Steel Works, Ltd.: *See*—
Aoyama, Shigetsune; Yoshikawa, Kazuo; Hasegawa, Yoshimichi; and Higuchi, Junichi, 4,512,559, Cl. 267-47.000.

Air Preheater Company, Inc., The: *See*—
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Air Products and Chemicals, Inc.: *See*—
Santangelo, Joseph G.; and Fernbacher, John M., 4,512,403, Cl. 166-261.000.

Aisin Seiki Kabushiki Kaisha: *See*—
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Ishikawa, Kazuo, 4,512,212, Cl. 74-733.000.
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Aisin Warner Kabushiki Kaisha: *See*—
Motomura, Jiro; Kamiya, Yasuhisa; and Nishikawa, Seiichi, 4,512,449, Cl. 192-3.280.

Aizawa, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage inverter device. 4,513,362, Cl. 363-41.000.

Akagi, Motonobu: *See*—
Kawabata, Yasuhiro; and Akagi, Motonobu, 4,512,153, Cl. 60-611.000.

Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Material for packaging light-sensitive materials. 4,513,050, Cl. 428-200.000.

Akashi, Goro: *See*—
Kitamoto, Tatsuji; and Akashi, Goro, 4,513,054, Cl. 428-329.000.

Akita, Shigeyuki: *See*—
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,512,189, Cl. 73-296.000.

Akutsu, Kazushi: *See*—
Hasebe, Koshi; Miura, Kunio; Ono, Takashi; Akutsu, Kazushi; and Minami, Kazuaki, 4,513,377, Cl. 364-449.000.

Al-Muddarris, Ghazi R., to Davy McKee Aktiengesellschaft. Dehydrogenation process. 4,513,162, Cl. 585-654.000.

Albert-Frankenthal AG: *See*—
Fischer, Emil, 4,512,506, Cl. 227-5.000.

Albrecht, Wolf-Wigand; Papp, Uwe; and Behrens, Dieter, to Hermann C. Starck Berlin. Valve metal powder doped with boron. 4,512,805, Cl. 75-244.000.

Alcoa Chemie GmbH: *See*—
Pohland, Horst; and Tielens, Arthur J., 4,512,959, Cl. 423-121.000.

Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., to University of Medicine and Dentistry of New Jersey. Bio-absorbable composite tissue scaffold. 4,512,038, Cl. 3-1.900.

Alexander, Martin. Method of measuring and/or monitoring the surface tension of fluids. 4,512,183, Cl. 73-64.400.

Alink, Aloysius J. W. O.; and van Marle, Berend P., to Thomassen International B.V. Device for the separation of particles from a stream of gas. 4,512,759, Cl. 494-14.000.

Allard, Joseph, to Eurotungstene. System for mounting tooth-carrier sectors on a cutter wheel or a milling-cutter drum. 4,512,612, Cl. 299-91.000.

Allec, Josiane: *See*—
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,513,011, Cl. 514-730.000.

Allen-Bradley Company: *See*—
Boysen, Gerd C.; Murray, Patrick S.; and Robinson, Marquis B., 4,513,181, Cl. 200-50.00C.

Allen, Edgar W.: *See*—
Farag, Samir F.; Allen, Edgar W.; and Little, Thomas R., 4,513,180, Cl. 200-50.00R.

Allied Corporation: *See*—
Dickson, James; and Hays, Charles, 4,513,020, Cl. 427-34.000.
Dieringer, Bruce G., 4,513,214, Cl. 310-71.000.
Kurtz, Bruce E., 4,513,154, Cl. 570-145.000.
Pauwels, Michael A.; Wright, Danny O.; Harvey, Bruce J.; and Bauer, Thomas J., 4,512,317, Cl. 123-478.000.
Tomsa, Vladimir, 4,512,623, Cl. 339-143.00R.
Wilensky, Barry F.; and Maggi, Joseph A., 4,513,318, Cl. 358-139.000.

Alps Electric Co., Ltd.: *See*—
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Altec Industries, Inc.: *See*—
Freudenthal, Frank D.; and Anderson, Carl M., 4,512,436, Cl. 182-2.000.

Altman, Frederick D.: *See*—
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Aluminium Pechiney: *See*—
Brun, Marcel; Perret, Andre; and Cailleux, Claude, 4,512,695, Cl. 409-134.000.
Aluminum Company of America: *See*—
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.
Alvarez, Ernest. Interchangably headed tool. 4,512,381, Cl. 145-29.00R.
Alverth, Ronald W.; and Schumacher, Thomas H., to Mako-Tek Corporation, The. Pullout roller assembly. 4,512,564, Cl. 271-274.000.
AM International: *See*—
Crist, Lee D., 4,512,255, Cl. 101-230.000.
Amano, Hidetoshi: *See*—
Abe, Shinichi; Taura, Mitsuharu; Amano, Hidetoshi; and Mizuno, Toshiaki, 4,512,320, Cl. 123-492.000.
AMAX, Inc.: *See*—
Bowersox, Bruce V.; and Shepherd, Thomas I., 4,512,430, Cl. 177-163.000.
Ambrose, Albert R.; and Fancett, Scott F., to Cooper Industries Inc. Oscillating axle override system. 4,512,589, Cl. 280-6.00R.
Amdahl Corporation: *See*—
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American Can Company: *See*—
Kudert, Frederick G.; Tennant, William A.; and Tung, Thomas T., 4,512,730, Cl. 425-130.000.
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American Sterilizer Company: *See*—
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AMP Incorporated: *See*—
Bakermans, Johannes C. W.; Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,513,353, Cl. 361-399.000.
Kumar, Vijay, 4,512,618, Cl. 339-14.00R.
Ampex Corporation: *See*—
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AMSTED Industries Incorporated: *See*—
Kozar, Robert S., 4,512,901, Cl. 210-792.000.
Anderson, Carl M.: *See*—
Freudenthal, Frank D.; and Anderson, Carl M., 4,512,436, Cl. 182-2.000.
Anderson, Donald G.; and Ferrara-Jordan, Elisa M., to American Home Products Corporation. Physiological trend data recorder. 4,513,294, Cl. 346-33.0ME.
Anderson, James J.: *See*—
Lyman, Dale E.; and Anderson, James J., 4,512,932, Cl. 260-990.000.
Anderson, Jeff L., to NCR Corporation. Method and apparatus for the production of electret material. 4,512,940, Cl. 264-22.000.
Anderson, R. David: *See*—
Jacobs, George S.; and Anderson, R. David, 4,512,365, Cl. 137-413.000.
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Anderton, John J., to GTE Products Corporation. Splice casing assembly. 4,512,628, Cl. 350-96.200.
Anderton, Kenneth; Hall, Nigel; Parton, Brian; Renfrew, Andrew H. M.; and Shaw, Malcolm G., to Imperial Chemical Industries PLC. Cationic triphendioxazine dyes, methods for their manufacture and their use for dyeing cellulosic substrates. 4,512,773, Cl. 8-657.000.
Andre, Robert T.: *See*—
Landry, Walter J.; and Andre, Robert T., 4,512,142, Cl. 56-13.900.
Andreev, Anatoly A.; and Romanov, Anatoly A. Method and apparatus for controlling plasma generation in vapor deposition. 4,512,867, Cl. 204-298.000.
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdon of Great Britian and Northern Ireland of Whitehall, The. Liquid crystal compounds. 4,512,636, Cl. 350-350.00R.
Angicor Limited: *See*—
Kaster, Robert L.; and Domaas, Perry M., 4,512,471, Cl. 206-438.000.
Angmorter, Paul K.; Simpson, Howard D.; and Richardson, Ryden L., to Union Oil Company of California. Hydrotreating catalyst and a method for preparing the catalyst. 4,513,097, Cl. 502-211.000.
Anhalt, Richard C. Saw chain rivet spinner. 4,512,070, Cl. 29-243.530.
ANIC, S.p.A.: *See*—
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Anniston Pump Shop, Inc.: *See*—
Lockwood, John C., 4,513,198, Cl. 235-61.00L.
Anstine, Larry D.; James, Dean B.; Melaika, Edward A.; and Peterson, John P., Jr., to United States of America, Energy. Nuclear reactor cooling system decontamination reagent regeneration. 4,512,921, Cl. 252-626.000.
Anthony, John, to Union Carbide Corporation. Multilayer film having a layer of low pressure, low density heterogeneous ethylene copolymers. 4,513,038, Cl. 428-35.000.
Antkowiak, Edward T. High-accuracy navigating apparatus with step-driven projected chart. 4,513,378, Cl. 364-450.000.
Aoki, Kozo: *See*—
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Apodaca, Jeffrey S., to Thomas & Betts Corporation. Strippable shielded electrical cable. 4,513,170, Cl. 174-36.000.
Arad, Yoel. Portable gas heater particularly useful for heating foodstuffs. 4,512,328, Cl. 126-37.00B.
Aragona, Louis. Punching bag apparatus and adjustable supporting means. 4,512,569, Cl. 272-78.000.
Arai, Naoki: *See*—
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Araki, Shuichi: *See*—
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Aratani, Matsuhiko: *See*—
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Archer, Wendel E.; Luther, James M.; and Thieken, Michael L., to AT&T Bell Laboratories. Optical fiber switch, electromagnetic actuating apparatus with permanent magnet latch control. 4,512,627, Cl. 350-96.200.
Ardac, Inc.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,513,439, Cl. 382-7.000.
Arias Mas, Gonzalo. Machine for making ice flakes from sea water or fresh water. 4,512,160, Cl. 62-71.000.
Arieh, Simon: *See*—
Courvoisier, Guy; and Arieh, Simon, 4,513,197, Cl. 219-527.000.
Aritake, Toshiyuki, to Mitsubishi Plastics Industries Limited. Adhesive tape and process for its production. 4,513,028, Cl. 427-173.000.
Arjomari-Prioux: *See*—
Vernois, Michel; and Duboeuf, Jean-Paul, 4,513,056, Cl. 428-264.000.
Armstrong, Richard J.: *See*—
Dickson, Edward J.; and Armstrong, Richard J., 4,512,535, Cl. 242-200.000.
Arndt, Eric D.: *See*—
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.
Arndt, Peter J.: *See*—
Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, 4,513,118, Cl. 525-81.000.
Arnold, Fred E.: *See*—
Reinhardt, Bruce A.; Arnold, Fred E.; and Unroe, Marilyn R., 4,513,131, Cl. 526-285.000.
Arthur D. Little, Inc.: *See*—
McCullough, John E., 4,512,066, Cl. 29-23.500.
Arts Et Techniques Nouvelles: *See*—
Augros, Jacques, 4,512,487, Cl. 215-274.000.
Asaba, Takao, to Yamaha Hatsudoki Kabushiki Kaisha. Engine with supercharger. 4,512,152, Cl. 60-601.000.
Asano, Mitsugu: *See*—
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.
Asano, Tadahiko: *See*—
Katayama, Sakae; Asano, Tadahiko; Marugame, Kazuo; Kanada, Sadaoki; and Kawasaki, Yoshinari, 4,512,552, Cl. 253-389.00R.
Asano, Toshiaki: *See*—
Ogawa, Akira; and Asano, Toshiaki, 4,512,807, Cl. 106-22.000.
ASC Incorporated: *See*—
Trostle, D. Mark; Kaltz, Milton C.; Moler, Ronald; and Cowsert, Lendell E., 4,512,606, Cl. 296-130.000.
Aschermann, Willi; and Haarhaus, Peter, to Gebr. Happich GmbH. Sun visor for automobiles. 4,512,605, Cl. 296-97.00G.
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, to Hoffmann-La Roche Inc. Cycloheptene derivatives. 4,513,002, Cl. 514-408.000.
ASEA Aktiebolag: *See*—
Ling, Bernt; and Sternad, Mikael, 4,512,711, Cl. 414-786.000.
Ashai Kogaku Kogyo Kabushiki Kaisha: *See*—
Ito, Tokuhisa; Ohno, Hideaki; Kurata, Izumi; and Okuyama, Takashi, 4,512,642, Cl. 354-4.000.
Ashland Oil, Inc.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.
Goel, Anil B., 4,512,927, Cl. 260-410.500.
Ashline, William J.: *See*—
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,513,268, Cl. 335-35.000.

Associated Dynamics, Incorporated: *See*—
Foran, Charles D.; and Smith, Jack D., 4,512,694, Cl. 409-12.000.
Associated Electrical Industries Limited: *See*—
Gill, Dennis, 4,512,827, Cl. 156-48.000.
Astec Components, Ltd.: *See*—
Josephson, Elliot, 4,513,226, Cl. 315-219.000.
Astfalk, Greg; Dougherty, Timothy S.; and Viriyayuthakorn, Montri, to AT&T Technologies, Inc. Methods of and apparatus for insulating a conductor with a plastic material. 4,512,944, Cl. 264-174.000.
AT&T Bell Laboratories: *See*—
Abys, Joseph A.; and Okinaka, Yutaka, 4,512,963, Cl. 423-387.000.
Archer, Wendel E.; Luther, James M.; and Thieken, Michael L., 4,512,627, Cl. 350-96.200.
Cox, Donald C., 4,513,412, Cl. 370-29.000.
Fraser, Alexander G., 4,513,411, Cl. 370-13.000.
Gulati, Surender K., 4,513,432, Cl. 377-121.000.
Jayant, Nuggehally S., 4,513,426, Cl. 375-26.000.
Ngo, Peter D. T., 4,513,281, Cl. 340-703.000.
Runge, Peter K., 4,512,630, Cl. 350-96.210.
von Seggern, Heinz; and Wang, Tsuey T., 4,512,941, Cl. 264-22.000.
AT&T Technologies, Inc.: *See*—
Astfalk, Greg; Dougherty, Timothy S.; and Viriyayuthakorn, Montri, 4,512,944, Cl. 264-174.000.
Dines, David R.; and Webb, Vertis C., 4,512,707, Cl. 414-404.000.
Ellis, Roland, Jr.; Jacobs, Brian E.; March, Edward J.; and Newman, Raymond J., 4,512,509, Cl. 228-180.200.
Attaway, Julian J., to MM Systems Corporation. Moldings. 4,512,127, Cl. 52-288.000.
Attia, Yosry A.; and Tewksbury, Ted L., to Battelle Development Corp. Process for producing a metalliferous concentrate from a particulate feed material. 4,512,879, Cl. 209-3.000.
Attwood, Michael R.; Hassall, Cedric H.; Lambert, Robert W.; Lawton, Geoffrey; and Redshaw, Sally, to Hoffmann-La Roche Inc. Pyridazo[1,2-a][1,2]diazepines. 4,512,924, Cl. 260-243.300.
Augros, Jacques, to Arts Et Techniques Nouvelles. Bottle stopper. 4,512,487, Cl. 215-274.000.
Aumann, James T.; and Filshtinsky, Michael, to Christensen, Inc. Coring device with an improved weighted core sleeve and anti-gripping collar. 4,512,423, Cl. 175-226.000.
Aumann, James T.: *See*—
Rowley, David S.; and Aumann, James T., 4,512,419, Cl. 175-58.000.
Austin, Hollis B.: *See*—
Phillips, Lot; Austin, Hollis B.; and Blakeslee, Kenneth S., 4,513,179, Cl. 179-175.30R.
Australian National University, The: *See*—
Brandstetter, Aharon, 4,513,167, Cl. 136-244.000.
Avidan, Amos A.; and Kam, Anthony Y., to Mobil Oil Corporation. Process for the conversion of alcohols and oxygenates to hydrocarbons in a turbulent fluid bed reactor. 4,513,160, Cl. 585-640.000.
AVL AG: *See*—
Marsoner, Hermann; Ritter, Christoph; Kleinhappl, Erich; and Strutz, Winfried, 4,512,953, Cl. 422-67.000.
Ayers, Buell O.; and Clardy, Edwin K. Pressure compensation for a chromatograph. 4,512,181, Cl. 73-23.100.
Ayres, Paul S.; Ziels, Burton D.; and Chen, Chou-Ming, to Babcock & Wilcox Company, The. Vacuum insulated stem injection tubing. 4,512,721, Cl. 417-51.000.
B. F. Goodrich Company: *See*—
Babbin, William R.; and Messerly, James W., 4,512,942, Cl. 264-26.000.
B & G Plastics, Inc.: *See*—
Kolton, Chester; and Spater, Stuart S., 4,512,093, Cl. 40-20.00R.
Babbin, William R.; and Messerly, James W., to B. F. Goodrich Company. Method and apparatus for vulcanizing hose. 4,512,942, Cl. 264-26.000.
Babcock, Daniel A. Clutch brake. 4,512,450, Cl. 192-12.00R.
Babcock & Wilcox Company, The: *See*—
Ayres, Paul S.; Ziels, Burton D.; and Chen, Chou-Ming, 4,512,721, Cl. 417-51.000.
Ghering, Walter L.; and Thompson, William L., 4,512,200, Cl. 73-861.040.
Wiener, Murray, 4,512,336, Cl. 126-442.000.
Babitzka, Rudolf; Haag, Gottlob; and Linder, Ernst, to Robert Bosch GmbH. Slip clutch. 4,512,452, Cl. 192-104.00C.
Bacardit, Juan S., to Bendiberica S.A. Hydraulic distributor with a reaction biased control member. 4,512,238, Cl. 91-370.000.
Back, Erik G.; and Lundin, Bjorn-Eric, to Boliden Aktiebolag. Process for recovering lead from lead chloride containing raw material. 4,512,803, Cl. 75-77.000.
Baghdady, Elie J. Method and apparatus for signal detection, separation and suppression. 4,513,249, Cl. 328-150.000.
Bailey, Warren P. N., to National Research Development Corporation. Optical inspection of machined surfaces. 4,512,663, Cl. 356-446.000.
Baker, Bradley D.; and Kelly, Richard L., to Dysan Corporation. Method and apparatus for disk drive alignment. 4,513,331, Cl. 360-75.000.
Baker Colony Farms Ltd.: *See*—
Maendel, Jonathan P., 4,512,393, Cl. 165-54.000.
Baker, Stephen R.; Jamieson, William B.; Ross, William J.; and Todd, Alec, to Lilly Industries Limited. SRS-A antagonists. 4,513,005, Cl. 514-451.000.
Bakermans, Johannes C. W.; Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Connection of leadless integrated circuit package to a circuit board. 4,513,353, Cl. 361-399.000.
Balch, Duane C., to Chartwell Corporation. Locking drain valve. 4,512,547, Cl. 251-115.000.
Balenger, John W. Weight transducer for inexpensive electronic scale. 4,512,432, Cl. 177-211.000.
Balko, Alexander B.; and Shah, Dhiraj M. Process for restoring patency to body vessels. 4,512,338, Cl. 128-1.00R.
Ball Corporation: *See*—
Falk, R. Aaron, 4,513,201, Cl. 250-342.000.
Ballard, James W.; and Ballard, Larry R., to Bonnici, Charles. Ventilator having insert for controlling moisture and method of making same. 4,512,243, Cl. 98-42.010.
Ballard, Larry R.: *See*—
Ballard, James W.; and Ballard, Larry R., 4,512,243, Cl. 98-42.010.
Ballmer, Horst, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Method and means for stepwise charge control of electrochromic layers. 4,512,637, Cl. 350-357.000.
Ballu, Patrick J., to Tecnoma. Agricultural sprayer. 4,512,516, Cl. 239-168.000.
Banford, Dennis W., to Peachtree Doors, Inc. Rigidified doorway. 4,512,124, Cl. 52-207.000.
Banks, Robert L.: *See*—
Kukes, Simon G.; and Banks, Robert L., 4,513,099, Cl. 502-228.000.
Baran, Walter J., Jr., to United Technologies Corporation. Turbine stator assembly. 4,512,712, Cl. 415-116.000.
Baravaglio, Marie E. Bullet trap for a shooting stand. 4,512,585, Cl. 273-410.000.
Barber-Colman Company: *See*—
Trost, Wayne C., 4,512,373, Cl. 139-11.000.
Barber, Forest C. Arthroscopic surgery dissecting apparatus. 4,512,344, Cl. 128-305.000.
Barber, Thomas D., to Schlumberger Technology Corporation. Phasor processing of induction logs including skin effect correction. 4,513,376, Cl. 364-422.000.
Barcy, Michael F., to CT Harwood Limited. Engine preheaters. 4,512,322, Cl. 123-549.000.
Bardell, Paul H., Jr.; and McAnney, William H., to International Business Machines Corporation. Simultaneous self-testing system. 4,513,418, Cl. 371-25.000.
Barden Corporation, The: *See*—
Saravis, Lawrence M., deceased; Stein, Jeffrey A.; and Saravis, Darren S., 4,512,617, Cl. 308-6.00C.
Barfield, Michelle D.; and Spector, George. Ornament. 4,513,035, Cl. 428-11.000.
Barker, Thruburn: *See*—
Ottsen, Henning; and Barker, Thruburn, 4,513,401, Cl. 367-19.000.
Barlow, Anthony: *See*—
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,512,920, Cl. 252-573.000.
Barnes, Casper W., to North American Philips Corporation. Ultrasound imaging with FM detection. 4,512,196, Cl. 73-620.000.
Barnhill, Martin L., III; and Pagac, William T., to Snap-on Tools Corporation. Fast lead socket wrench. 4,512,220, Cl. 81-121.100.
Barre, Claude, to Siemens Aktiengesellschaft. Circuit arrangement constructed in ECL circuitry. 4,513,210, Cl. 307-455.000.
Barrera, Giorgio. Apparatus for forming stator coils of dynamo electric machines. 4,512,376, Cl. 140-92.100.
Barrett, Paul Q.: *See*—
Gorman, Anthony G.; Smith, Peter L.; and Barrett, Paul Q., 4,513,413, Cl. 370-30.000.
Barringer, Eric A.; and Eagar, Thomas W., to Massachusetts Institute of Technology. Non-hygroscopic welding flux binders. 4,512,822, Cl. 148-24.000.
Barry Wright Corporation: *See*—
Cholakis, Peter N., 4,512,720, Cl. 416-241.00A.
Bartelsen, Lutz; and Neuendorf, Hans-Cristoph, to Flachglas Aktiengesellschaft. Electric self-defrosting windshield heating arrangement providing fast or slow heat. 4,513,196, Cl. 219-203.000.
BASF Aktiengesellschaft: *See*—
Fischer, Rolf; Weitz, Hans-Martin; and Siegel, Hardo, 4,513,150, Cl. 568-385.000.
Hahn, Erwin; and Neumann, Peter, 4,512,929, Cl. 260-453.0AR.
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,513,105, Cl. 521-56.000.
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,512,797, Cl. 71-93.000.
Rieber, Norbert; Platz, Rolf; and Jung, Johann, 4,512,795, Cl. 71-88.000.
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,512,984, Cl. 514-147.000.
Battelle Development Corp.: *See*—
Attia, Yosry A.; and Tewksbury, Ted L., 4,512,879, Cl. 209-3.000.
Battelle-Institut E.V.: *See*—
Beuter, Karl, 4,512,194, Cl. 73-579.000.
Battelle Memorial Institute: *See*—
Courvoisier, Guy; and Arieh, Simon, 4,513,197, Cl. 219-527.000.
Bauer, Bernhard: *See*—
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, 4,512,670, Cl. 384-147.000.
Olschewski, Armin; Herrmann, Gerhard; Bauer, Bernhard; and Zirk, Elisabeth, 4,512,672, Cl. 384-477.000.
Bauer, Ewald; and Krejza, Jurgen, to Wurttembergische Metallwarenfabrik AG. Saucepan lid with detachable handle. 4,512,495, Cl. 220-316.000.
Bauer, Gunter; and Eckert, Joachim, to GfE Gesellschaft fur Elektrometallurgie mbH. Method of recovering molybdenum oxide. 4,512,958, Cl. 423-55.000.

Bauer, Heinz; and Becker, Hans, to Linde Aktiengesellschaft. Multistage rectification of gaseous hydrocarbons containing sour gases. 4,512,782, Cl. 55-48.000.

Bauer, Thomas J.: *See*—
Pauwels, Michael A.; Wright, Danny O.; Harvey, Bruce J.; and Bauer, Thomas J., 4,512,317, Cl. 123-478.000.

Baus, Heinz G. Structural assembly, for shower partition or the like. 4,512,045, Cl. 4-610.000.

Bausch & Lomb Incorporated: *See*—
Clark, James A.; and Gabriel, Alfred P., 4,512,206, Cl. 74-10.540.

Bayer Aktiengesellschaft: *See*—
Kuhle, Engelbert; Klauke, Erich; Paulus, Wilfried; and Genth, Hermann, 4,513,003, Cl. 514-411.000.
Maurer, Fritz; Homeyer, Bernhard; and Hammann, Ingeborg, 4,513,000, Cl. 514-407.000.
Raue, Roderich; Huhne, Volker; and Kuhlthau, Hans-Peter, 4,513,142, Cl. 548-507.000.

Bayssat, Michel; Belleville, Maryse; and Grand, Marcel, to Lipha, Lyonnaise Industrielle Pharmaceutique. Long-acting theophylline in medicinal form. 4,512,994, Cl. 514-374.000.

BBC Brown, Boveri & Company, Limited: *See*—
Hutchings, Ron; Loitzl, Ruzica; and Muller, Klaus, 4,513,102, Cl. 502-325.000.
Keller, Jakob, 4,512,548, Cl. 251-124.000.

Beaver Products, Inc.: *See*—
Walston, Everett V., 4,512,126, Cl. 52-251.000.

Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., to Ashland Oil, Inc. Immobilization of vanadia deposited on sorbent materials during treatment of carbo-metallic oils. 4,513,093, Cl. 502-84.000.

Becker, Hans: *See*—
Bauer, Heinz; and Becker, Hans, 4,512,782, Cl. 55-48.000.

Becker, Werner: *See*—
Poetsch, Dieter; Massmann, Volker; Becker, Werner; and Wagner, Horst, 4,513,324, Cl. 358-214.000.

Beckman Instruments, Inc.: *See*—
Wedemeyer, Robert C.; and Giebeler, Robert H., Jr., 4,512,758, Cl. 494-13.000.
Wright, Herschel E.; and Wedemeyer, Robert C., 4,512,202, Cl. 73-863.000.

Beckman, John H., to Union Carbide Corporation. Casing sizing means and method. 4,512,059, Cl. 17-45.000.

Beer, Gunter: *See*—
Pesch, Wolfgang; and Beer, Gunter, 4,512,808, Cl. 106-83.000.

Beers, Dale M., to General Electric Company. Low modulus one component RTV compositions processes. 4,513,115, Cl. 524-731.000.

Behrens, Dieter: *See*—
Albrecht, Wolf-Wigand; Papp, Uwe; and Behrens, Dieter, 4,512,805, Cl. 75-244.000.

Beiersdorf AG: *See*—
Grah, Klaus, 4,512,854, Cl. 204-15.000.

Belbel, Elie; Blanchard, Christian; Lauraire, Michel; Fechant, Louis; and Haury, Andre , to La Telemecanique Electrique. Contactor having self-protection means against the effect of the forces of repulsion between the contacts. 4,513,270, Cl. 335-195.000.

Belbin, Chesley E., Sr. Tablet storage and dispensing device. 4,512,500, Cl. 221-82.000.

Bell, Alan G.: *See*—
Borriello, Gaetano; Lyon, Richard F.; and Bell, Alan G., 4,513,427, Cl. 375-110.000.

Belleville, Maryse: *See*—
Bayssat, Michel; Belleville, Maryse; and Grand, Marcel, 4,512,994, Cl. 514-374.000.

Bendiberica S.A.: *See*—
Bacardit, Juan S., 4,512,238, Cl. 91-370.000.

Bendix Corporation, The: *See*—
Runkle, Dean E.; and Colpaert, James J., 4,512,445, Cl. 188-71.900.

Benecke, Herman P.: *See*—
Revici, Emanuel; Sherwood, Bob E.; Benecke, Herman P.; Rice, John M.; and Geisler, Richard W., 4,513,008, Cl. 514-560.000.

Benjamin, Terry A.: *See*—
Valayil, Silvester; Abu-Moustafa, Magda; and Benjamin, Terry A., 4,512,818, Cl. 148-6.14R.

Bennett, Gloria A.; Elder, Michael G.; and Kemme, Joseph E., to United States of America, Energy. Thermal protection apparatus. 4,513,352, Cl. 361-385.000.

Bennett, James G., Jr.; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether compositions. 4,513,120, Cl. 525-316.000.

Benning, Larry J.: *See*—
van Ee, Dirk; and Benning, Larry J., 4,512,392, Cl. 165-54.000.

Benson, Glendon M., to New Process Industries, Inc. Constant temperature element. 4,512,150, Cl. 60-526.000.

Bentley Laboratories, Inc.: *See*—
Raible, Donald A., 4,512,761, Cl. 604-8.000.

Berfield, Robert C., to Shop-Vac Corporation. Vibration isolating means. 4,512,713, Cl. 415-119.000.

Bergsrom, Bengt: *See*—
Edgren, Anders; Soderberg, Jan; and Bergstrom, Bengt, 4,513,106, Cl. 521-58.000.

Berkowitz, Irving L., to Kason Industries Inc. Panel fastener system. 4,512,122, Cl. 52-127.900.

Berry, Christopher: *See*—
Abbott, James B.; Kohn, Ernest O.; Berry, Christopher; and Slade, Mark N., 4,512,172, Cl. 72-68.000.

Beth Israel Hospital Association, The: *See*—
Spears, James R., 4,512,762, Cl. 604-21.000.

Bethurum, Gary C., to Thomas & Betts Corporation. Flat cable pitch transition connector. 4,512,621, Cl. 339-99.00R.

Bettendorf Stanford Inc.: *See*—
Koberlein, Ross D., 4,512,137, Cl. 53-435.000.

Beuter, Karl, to Battelle-Institut E.V. Method and apparatus for controlling or measuring the thickness of material layers. 4,512,194, Cl. 73-579.000.

Bhaskar, Ravi K.: *See*—
Sparer, Randall V.; and Bhaskar, Ravi K., 4,513,034, Cl. 428-1.000.

BHS-Dr. Ing Hofler, Maschinenbau GmbH: *See*—
van de Locht, Heinrich, 4,512,109, Cl. 51-123.00G.

Bicocchi, Eugenio. Audio-visual device for gymnastic implements. 4,512,566, Cl. 272-72.000.

Bidegaray, Dominique A., to Christensen, Inc. Rotating bits including a plurality of types of preferential cutting elements. 4,512,426, Cl. 175-329.000.

Billings, Jeff. Excavator bucket with retractable scraper and scarifier. 4,512,090, Cl. 37-117.500.

Binder, Kurt: *See*—
Gast, Theodor; Kubach, Hans; and Binder, Kurt, 4,512,549, Cl. 251-137.000.

Binnig, Rupert; Gerlach, Gunter; Nilles, Peter; and Pankatz, Jurgen, to SEITZ ENZINGER NOLL Maschinenbau Aktiengesellschaft. Method and apparatus for cleaning containers. 4,512,811, Cl. 134-10.000.

Bird, David: *See*—
Acklam, Donald J.; Bird, David; and Hill, Graham A., 4,513,235, Cl. 318-685.000.

Bird Machine Company, Inc.: *See*—
Flynn, Peter J., 4,512,888, Cl. 210-221.200.

Bistrian, Bruce R.: *See*—
Moldawer, Lyle L.; Blackburn, George L.; and Bistrian, Bruce R., 4,512,974, Cl. 424-101.000.

Bixby, Lawrence B. Rungless motorized ladder. 4,512,440, Cl. 182-146.000.

Black & Decker Inc.: *See*—
Pfanzer, Gerhard, 4,512,078, Cl. 30-393.000.

Black, Maurice. Book holder. 4,512,542, Cl. 248-460.000.

Blackburn, George L.: *See*—
Moldawer, Lyle L.; Blackburn, George L.; and Bistrian, Bruce R., 4,512,974, Cl. 424-101.000.

Blaha, John F.: *See*—
Schriber, Louis; Stephens, Robert E.; and Blaha, John F., 4,512,256, Cl. 101-248.000.

Blain, Aurele. Clamp-on ammeter. 4,513,246, Cl. 324-127.000.

Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J. No-stir dry mix with pudding nuggets for cake with discontinuous pudding phase. 4,513,016, Cl. 426-554.000.

Blakeslee, Edward A., to Sperry Corporation. Stub draper drive for draper header. 4,512,140, Cl. 56-11.600.

Blakeslee, Kenneth S.: *See*—
Phillips, Lot; Austin, Hollis B.; and Blakeslee, Kenneth S., 4,513,179, Cl. 179-175.30R.

Blanchard, Christian: *See*—
Belbel, Elie; Blanchard, Christian; Lauraire, Michel; Fechant, Louis; and Haury, Andre , 4,513,270, Cl. 335-195.000.

Blanding, Douglass L.; and Muszak, Martin F., to Eastman Kodak Company. Apparatus for storing and dispensing analysis slides. 4,512,952, Cl. 422-63.000.

Blase, Manfred: *See*—
Wagener, Dietrich; and Blase, Manfred, 4,512,080, Cl. 33-125.00T.

Blazer International Corp.: *See*—
Lemme, Charles D., 4,513,358, Cl. 362-276.000.

Blevins, Milton L.; and Seiter, Charles R., to Combustion Engineering, Inc. Tube end deforming tool. 4,512,178, Cl. 72-393.000.

Bloomer, Milton D., to General Electric Company. Alternating comparator circuitry for improved discrete sampling resistance control. 4,513,207, Cl. 307-126.000.

Bloomfield, Philip E., to Pennwalt Corporation. Weight sensing apparatus employing polymeric piezoelectric film. 4,512,431, Cl. 177-210.00R.

Bloss, Walter L., III; and Brody, Edward M., to GTE Laboratories Incorporated. Multi-wavelength demultiplexer for fiber optical communication. 4,513,305, Cl. 357-30.000.

Boccalatte, Vitale, to Fiat Auto S.p.A. Overhead conveyor installation for motor vehicle bodies particularly for electrophoresis paint lines, and a body carrier usable in this installation. 4,512,869, Cl. 204-300.0EC.

Bodine, Albert G. Method for forming a cement annulus for a well. 4,512,401, Cl. 166-249.000.

Boehland, Burnell G.; and Coutts, Donald G., to Speedy Automatic Chimney Sweep, Inc. Chimney cleaning apparatus with motor drive. 4,512,055, Cl. 15-249.000.

Boeing Company, The: *See*—
Ackermann, Albert B.; Jones, Donald K.; and Holey, Timothy M., 4,512,539, Cl. 244-137.00P.
Small, Vincent J., 4,513,419, Cl. 371-29.000.

Bohanon, Hoy R., Sr., to Acme Engineering & Manufacturing Corp. Heat destratification method and system. 4,512,242, Cl. 98-31.500.

Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., to International Business Machines Corporation. Mask and system for mutually aligning objects in ray exposure systems. 4,513,203, Cl. 250-491.100.

Boichu, Claude P.; and Yeou, Victor, to Poclain. Earth-moving machine with boom, dipperstick and bucket, equipped with means for directionally-adjusting the bucket. 4,512,708, Cl. 414-694.000.

Boliden Aktiebolag: *See*—
Back, Erik G.; and Lundin, Bjorn-Eric, 4,512,803, Cl. 75-77.000.
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,512,798, Cl. 75-3.000.

Boltze, Karl-Heinz; and Horstmann, Harald, to Troponwerke GmbH & Co. KG. Indole derivatives, processes for their preparation, and their use as medicaments. 4,513,004, Cl. 514-414.000.

Boms, Manfred: *See*—
Mahler, Gert; Falkenroth, Heinz-Jurgen; Leitermann, Wulf; and Boms, Manfred, 4,512,240, Cl. 98-2.040.

Bondoc, Alfredo A.; Flood, Eugene J.; and Sieling, Frederick W., to GAF Corporation. Sheet type felt. 4,513,045, Cl. 428-137.000.

Bonifield, Thomas D.; and Purdes, Andrew J., to Texas Instruments Incorporated. Plasma reactor sidewall shield. 4,512,283, Cl. 118-723.000.

Bonifield, Thomas D.: *See*—
Purdes, Andrew J.; and Bonifield, Thomas D., 4,513,021, Cl. 427-38.000.

Bonnici, Charles: *See*—
Ballard, James W.; and Ballard, Larry R., 4,512,243, Cl. 98-42.010.

Borden, Peter G., to Varian Associates, Inc. Three-terminal solar cell circuit. 4,513,168, Cl. 136-244.000.

Borg-Warner Corporation: *See*—
Cole, Edward H., Jr.; and Ledvina, Timothy J., 4,512,754, Cl. 474-245.000.

Borriello, Gaetano; Lyon, Richard F.; and Bell, Alan G., to Xerox Corporation. Data and clock recovery system for data communication controller. 4,513,427, Cl. 375-110.000.

Bowditch, Philip N., to Charles Stark Draper Laboratory, Inc., The. Automated assembly system for seamed articles. 4,512,269, Cl. 112-121.120.

Bowen, David R.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,512,919, Cl. 252-522.00R.

Bowersox, Bruce V.; and Shepherd, Thomas I., to AMAX, Inc. Electronic coupled-in-motion railroad track scale. 4,512,430, Cl. 177-163.000.

Bowman, David F., to RCA Corporation. Dipole radiating element. 4,513,292, Cl. 343-795.000.

Bowman, Melvin B., to Ford Motor Company. Foldback current limiting driver. 4,513,241, Cl. 323-285.000.

Boysen, Gerd C.; Murray, Patrick S.; and Robinson, Marquis B., to Allen-Bradley Company. Combination mechanical and electrical interlock mechanism. 4,513,181, Cl. 200-50.00C.

Brackmann, Warren A., to Rothmans of Pall Mall Canada Limited. Tobacco drying procedure. 4,512,353, Cl. 131-304.000.

Branca, Quirico: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,513,002, Cl. 514-408.000.

Brancq, Bernard; and Malandain, Michel, to SEPPIC. Film-forming compositions for enveloping solid forms, particularly pharmaceutical or food products or seeds, and products obtained, coated with said compositions. 4,513,019, Cl. 427-3.000.

Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., to International Paper Company. Wet-laid, non-woven fabrics. 4,512,849, Cl. 162-157.200.

Brandstetter, Aharon, to Australian National University, The. Arrays of polarized energy-generating elements. 4,513,167, Cl. 136-244.000.

Brandtjen & Kluge, Inc.: *See*—
Ury, Frank, 4,512,561, Cl. 270-40.000.

Brasseur, Georg; and Rathmayr, Heinz, to Friedmann & Maier Aktiengesellschaft. Device for shutting down a fuel injection combustion engine. 4,512,306, Cl. 123-367.000.

Brauer, Hans; and Gerhards, Hans-Dieter, to Kocks Technik GmbH & Co. Tube release rolling mills. 4,512,173, Cl. 72-98.000.

Braun, Rosalinde, to Ciba-Geigy Corporation. Pressure-sensitive or heat-sensitive recording material. 4,513,302, Cl. 346-210.000.

Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., to National Distillers and Chemical Corporation. Silanes useful as anti-treeing additives. 4,512,920, Cl. 252-573.000.

Breen, Thomas J., to Rand McNally & Company. Tamper-resisting negotiable instruments containing a transparent verifying web. 4,512,595, Cl. 283-70.000.

Breimer, Hendrik; Van Roessel, Frederik J.; and Tienkamp, Engbert, to U.S. Philips Corporation. Method for automatically setting up a television camera. 4,513,319, Cl. 358-163.000.

Bremer, Robert C., Jr.: *See*—
Marr, Louise C.; and Bremer, Robert C., Jr., 4,512,716, Cl. 415-205.000.

Brenneman, Gary W. Belt tensioning device. 4,512,752, Cl. 474-114.000.

Bretford Manufacturing, Inc.: *See*—
Petrick, David C., 4,512,543, Cl. 248-670.000.

Bricot, Claude, to Thomson-CSF. Device for optical recording and read-out of data along a prerecorded track. 4,513,407, Cl. 369-44.000.

Briggs & Stratton Corp.: *See*—
Uuskallio, Arvo F., 4,512,499, Cl. 220-374.000.

British Aerospace Public Limited Company: *See*—
Acklam, Donald J.; Bird, David; and Hill, Graham A., 4,513,235, Cl. 318-685.000.

British Gas Corporation: *See*—
Wild, Keith R., 4,512,777, Cl. 48-210.000.

Brock, Kenneth A., to Christensen, Inc. Up-drill sub for use in rotary drilling. 4,512,425, Cl. 175-329.000.

Brody, Edward M.: *See*—
Bloss, Walter L., III; and Brody, Edward M., 4,513,305, Cl. 357-30.000.

Bronchart, Robert D. E. M.: *See*—
Lepain, Andre; and Bronchart, Robert D. E. M., 4,512,914, Cl. 252-355:000.

Brown, James L., to Rockwell International Corporation. CMOS/SOS transistor gate array apparatus. 4,513,307, Cl. 357-42.000.

Bruce, Robert M. Transaction numbering apparatus. 4,513,375, Cl. 364-401.000.

Brueggemann, Harry P., to Xerox Corporation. Scanner optics with no cross scan field curvature. 4,512,625, Cl. 350-6.800.

Brun, Marcel; Perret, Andre; and Cailleux, Claude, to Aluminium Pechiney. Apparatus for separating electrolysis bath residues on precalcined anodes. 4,512,695, Cl. 409-134.000.

Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Microcomposite of metal boride and ceramic particles. 4,512,946, Cl. 264-332.000.

Brunelle, Daniel J.; and Singleton, Daniel A., to General Electric Company. Method for making aromatic ethers using diorganoamino pyridinum salt catalyst. 4,513,141, Cl. 548-476.000.

Brunner, Arthur: *See*—
Ernst, Alfons; and Brunner, Arthur, 4,512,184, Cl. 73-116.000.

Bruno, Caminiti. Last with device for aperture adjustment as required and shield element for last adaptability to right and left shoes. 4,512,052, Cl. 12-116.200.

Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, to International Business Machines Corporation. Method of measuring the thickness of the removed layer in subtractive workpiece processing. 4,512,847, Cl. 156-626.000.

Brunswick Corporation: *See*—
Hundertmark, James M., 4,512,292, Cl. 123-65.00B.

Bubley, Henry J., to American Screen Printing Equipment Company. Takeoff method and apparatus. 4,512,563, Cl. 271-85.000.

Bucher, Heinz, to Metronic Electronic GmbH. Air bubble hydromassaging apparatus. 4,512,934, Cl. 261-64.00B.

Buchmuller, Horst; and Michelbrink, Bernhard, to Deutsche Babcock Aktiengesellschaft. West ash remover. 4,512,265, Cl. 110-171.000.

Buck, Carl J., to Johnson & Johnson Products, Inc. Visible light cured orthopedic polymer casts. 4,512,340, Cl. 128-90.000.

Buck, James C. Brush conditioner for car wash. 4,512,814, Cl. 134-34.000.

Buck, Kenneth J.; Grace, Robert E.; and Hayes, Thomas A., Jr., to Xerox Corporation. Control scheme compensating for changing characteristics of a photoconductive member used in an electrophotographic printing machine. 4,512,652, Cl. 355-14.0CH.

Buderus Aktiengesellschaft: *See*—
Stiegler, Hartmut, 4,512,327, Cl. 126-21.00A.

Budinger, William D. Workpiece holder for polishing operation. 4,512,113, Cl. 51-236.000.

Buholz, Neal E., to United States of America, Air Force. CO_2 Laser stabilization and switching. 4,513,422, Cl. 372-29.000.

Bullivant, Kenneth W., to K-Tron International, Inc. Weighing apparatus and method. 4,512,428, Cl. 177-25.000.

Bunce, Earl G. Rotary engine. 4,512,302, Cl. 123-238.000.

Bunker, James W.; and Ritchie, Robert S., to United States of America, National Aeronautics and Space Administration. Slide release mechanism. 4,512,678, Cl. 403-15.000.

Burborough, William R., to Lucas Industries public limited company. Fuel injection pump of the rotary distributor type. 4,512,727, Cl. 417-462.000.

Burdg, Charles E.: *See*—
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., 4,512,179, Cl. 73-4.00R.

Buren, Kurt J. A.: *See*—
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,512,798, Cl. 75-3.000.

Burilla, Charles T.: *See*—
Clark, Thomas E.; and Burilla, Charles T., 4,513,025, Cl. 427-68.000.

Burke, James W.; Krueger, John D.; and Krueger, John W., to Krubur, Inc. Aerosol cannister fitting. 4,512,587, Cl. 277-205.000.

Burkhardt, Horst, to Dr. Johannes Heidenhain GmbH. Error correction arrangement for digital length or angle measuring device. 4,512,082, Cl. 33-125.00R.

Burkle, Erwin: *See*—
Eichlseder, Martin; and Burkle, Erwin, 4,512,733, Cl. 425-207.000.

Burlington Industries, Inc.: *See*—
Leach, Jack; and Davis, Delbert A., 4,513,047, Cl. 428-175.000.

Burns, James W. P.: *See*—
Zaneveld, Lourens J. D.; and Burns, James W. P., 4,512,342, Cl. 128-303.00R.

Burroughs Corporation: *See*—
Schwartz, Sidney J., deceased, 4,513,396, Cl. 365-6.000.
Seitz, Charles L.; Grunewald, Paul; Parker, Marshall M.; and Stafford, Irvin G., 4,513,278, Cl. 340-347.0DA.

Burroughs Wellcome Co.: *See*—
Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., 4,512,992, Cl. 514-258.000.

Burton, Rufus L., Jr.: *See*—
Dunham, David A.; Riggs, Robert P.; and Burton, Rufus L., Jr., 4,512,553, Cl. 254-89.00R.

Busby, David C.: *See*—
Wegman, Richard W.; and Busby, David C., 4,513,151, Cl. 568-484.000.

Bylund, Sven O., to Santrade Ltd. Cutting insert and cutting tool therefor. 4,512,689, Cl. 407-40.000.
C. R. Bard, Inc.: *See*—
Norton, William J., 4,512,771, Cl. 604-824.000.
Cailleux, Claude: *See*—
Brun, Marcel; Perret, Andre; and Cailleux, Claude, 4,512,695, Cl. 409-134.000.
Calame-Lonjean, Andre ; and Naujalis, Pierre, to Commissariat a l'Energie Atomique. Liquid sampling device. 4,512,203, Cl. 73-863.810.
Calgon Corporation: *See*—
Howe, Michael W.; and Sopp, Samuel W., 4,512,823, Cl. 148-113.000.
Myers, John G.; Logan, Douglas P.; and Walker, Jerry L., 4,512,774, Cl. 44-51.000.
Callegari, Stephen R., Sr.; and Rogers, Tommie L., to Rogers, Tommie. Pipe spinner. 4,512,216, Cl. 81-57.170.
Calvert, Rodney K.: *See*—
Scott, Dale K.; and Calvert, Rodney K., 4,512,135, Cl. 53-285.000.
Camco Incorporated: *See*—
Pringle, Ronald E., 4,512,411, Cl. 166-54.500.
Cameron, Robert W., to Timken Company, The. Cone type rock crusher and bearing arrangement therefor. 4,512,525, Cl. 241-207.000.
Campbell, Donn V.: *See*—
Goodall, Steve R.; Dubowicz, Palemon W.; and Campbell, Donn V., 4,513,338, Cl. 361-1.000.
Campbell, Gerald D.: *See*—
Cegielski, John M., Jr.; Campbell, Gerald D.; and Schaub, Clyde D., 4,512,267, Cl. 110-347.000.
Campbell, John W. Swinging fire apparatus pump operator panel. 4,512,412, Cl. 169-24.000.
Campbell, Jules D., Jr.: *See*—
Jamiolkowski, Michael J.; and Campbell, Jules D., Jr., 4,513,258, Cl. 331-111.000.
Campbell, Kirk B.: *See*—
Campbell, Richard J., Jr.; and Campbell, Kirk B., 4,512,274, Cl. 112-423.000.
Campbell, Richard J., Jr.; and Campbell, Kirk B. Seam for tube of cloth, fabric or flexible material. 4,512,274, Cl. 112-423.000.
Canon Kabushiki Kaisha: *See*—
Ishida, Masato; and Takeda, Hiroaki, 4,512,655, Cl. 355-55.000.
Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, 4,513,219, Cl. 310-328.000.
Kikukawa, Noriyuki; and Yamada, Yasuaki, 4,513,236, Cl. 318-696.000.
Kinoshita, Takao; and Sakai, Shinji, 4,513,313, Cl. 358-44.000.
Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,512,641, Cl. 350-573.000.
Okamura, Shigeru, 4,513,297, Cl. 346-140.00R.
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, 4,512,656, Cl. 354-475.000.
Tokuda, Ryuji, 4,512,643, Cl. 354-21.000.
Tokumitsu, Jun; and Minoura, Kazuo, 4,512,632, Cl. 350-167.000.
Yoshida, Masaaki, 4,512,644, Cl. 354-149.100.
Cantec, Inc.: *See*—
Frei, Siegfried; and Koch, Jakob, 4,512,490, Cl. 220-72.000.
Caralli, Michael J.; and Friedline, Gary W., to Pittsburgh Brass Manufacturing Company. Shuttle valves and system for fluid control. 4,512,781, Cl. 55-26.000.
Carette, Brigitte; Kone, Ali; Souquet, Jean-Louis; Ribes, Michel; and Maurin, Maurice, to Centre National de la Recherche Scientifique. Vitreous materials with ionic conductivity, the preparation of same and the electrochemical applications thereof. 4,513,070, Cl. 429-193.000.
Carl Schenck AG: *See*—
Giers, Alfred; and Heiland, Manfred, 4,512,671, Cl. 384-215.000.
Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Ballmer, Horst, 4,512,637, Cl. 350-357.000.
Carman, Carol S.: *See*—
Koser, Gerald F.; and Carman, Carol S., 4,513,137, Cl. 546-14.000.
Carney, William V.; and Fasano, Michael, to Porta Systems Corp. Conductor guide means for telephone connector blocks. 4,512,622, Cl. 339-103.00M.
Carr, Neil: *See*—
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,512,636, Cl. 350-350.00R.
Carrier, Anthony. Winter boot. 4,512,089, Cl. 36-112.000.
Carroll, Thomas J.; Corsello, Vincent G.; Glass, Michael; and Piccolo, Dominic J., to Warner-Lambert Company. Powdered center-filled chewing gum compositions. 4,513,012, Cl. 426-5.000.
Carruthers, James D.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.
Carson, Lansing M., to Motorola, Inc. Simplified frequency scheme for coherent transponders. 4,513,447, Cl. 455-76.000.
Carydias, Roger; and Pacradouni, Chahan. Handling system for precast units. 4,512,121, Cl. 52-125.200.
Cascini, Michael R., to Rockwell International Corporation. Torque limiting fastener. 4,512,697, Cl. 411-7.000.
CBI Offshore, Inc.: *See*—
Hale, David R.; Owen, William A.; and Orndorff, James A., Jr., 4,512,684, Cl. 405-217.000.
Cegielski, John M., Jr.; Campbell, Gerald D.; and Schaub, Clyde D., to John Zink Company. Methods and apparatus for combusting ash producing solids. 4,512,267, Cl. 110-347.000.
Celanese Corporation: *See*—
Cobb, Arnold J., 4,512,731, Cl. 425-198.000.
Wang, Donald G. J., 4,512,894, Cl. 210-500.200.
Celio, John A., to NCR Corporation. Computer interface apparatus using split-cycle lookahead addressing for faster access to paged memory. 4,513,371, Cl. 364-200.000.
Central Glass Company Limited: *See*—
Hayakawa, Masanori; and Nishimura, Satoshi, 4,512,906, Cl. 252-62.630.
Centre National de la Recherche Scientifique: *See*—
Carette, Brigitte; Kone, Ali; Souquet, Jean-Louis; Ribes, Michel; and Maurin, Maurice, 4,513,070, Cl. 429-193.000.
Chainer, Timothy J.; Scranton, Robert A.; and Worthington, Thomas K., to International Business Machines Corporation. Data input pen for Signature Verification. 4,513,437, Cl. 382-3.000.
Chaki, Takao, to Clarion Co., Ltd. Pushbutton-operated waveband or station selector. 4,512,204, Cl. 74-10.330.
Chaki, Takao, to Clarion Co., Ltd. Arm mechanism of a pushbutton tuner. 4,512,205, Cl. 74-10.330.
Chamberlain, Savvas G.; and Schlig, Eugene S., to International Business Machines Corporation. Charge coupled device output circuit structure. 4,513,431, Cl. 377-60.000.
Chamberlin, Ronald D., to PPG Industries, Inc. Prevention of corrosion of electrolyte cell components. 4,512,857, Cl. 204-98.000.
Champion International Corporation: *See*—
Hain, Paul O.; and Lepisto, J. George, 4,512,479, Cl. 206-632.000.
Korte, Ralph J., 4,512,478, Cl. 206-611.000.
Thompson, Kenneth P.; and Ihde, Richard C., 4,513,036, Cl. 428-35.000.
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., to International Business Machines Corporation. Cache locking controls in a multiprocessor. 4,513,367, Cl. 364-200.000.
Chandler Evans Inc.: *See*—
Waterman, Harold J., Jr., 4,512,101, Cl. 42-71.00R.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Hydrothermal zeolite activation. 4,513,091, Cl. 502-71.000.
Chang, Clarence D.: *See*—
Miale, Joseph N.; and Chang, Clarence D., 4,512,876, Cl. 208-114.000.
Chang, Ning: *See*—
Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, 4,512,349, Cl. 128-632.000.
Chapman, Robert A.: *See*—
Doulton, Romm; and Chapman, Robert A., 4,512,667, Cl. 368-10.000.
Chappell, William A.; Tweed, William J.; and Higgins, David T., to Rival Manufacturing Company. Percolator including pump-type dispenser. 4,512,246, Cl. 99-312.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Bowditch, Philip N., 4,512,269, Cl. 112-121.120.
Charles Wyle Engineering Corporation: *See*—
Wyle, Charles; and Shea, Donald M., 4,512,947, Cl. 264-343.000.
Chartwell Corporation: *See*—
Balch, Duane C., 4,512,547, Cl. 251-115.000.
Chemische Werke Huels, AG: *See*—
Hanssle, Peter; and Zaar, Wolfgang, 4,513,157, Cl. 585-378.000.
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., 4,512,926, Cl. 260-398.000.
Chen, Chou-Ming: *See*—
Ayres, Paul S.; Ziels, Burton D.; and Chen, Chou-Ming, 4,512,721, Cl. 417-51.000.
Chen, Hsing-Yao, to RCA Corporation. Color picture tube having reconvergence slots formed in a screen grid electrode of an inline eleetron gun. 4,513,222, Cl. 313-412.000.
Chen, Jackson C., to Ethyl Corporation. Cold flow improver. 4,512,775, Cl. 44-62.000.
Chen, Johnson C. H.; and Eichelberger, John L., to Pennwalt Corporation. Encapsulated phase change thermal energy storage materials and process. 4,513,053, Cl. 428-221.000.
Chen, Otis Y.: *See*—
Duhl, David N.; Chen, Otis Y.; and Gell, Maurice L., 4,512,817, Cl. 148-3.000.
Chen, Tsang J., to Eastman Kodak Company. Compositions containing hydrophobic addenda uniformly loaded in latex polymer particles. 4,512,969, Cl. 424-81.000.
Chevron Research Company: *See*—
Rose, Allan F., 4,512,995, Cl. 514-277.000.
Simon, Ralph, 4,512,400, Cl. 166-245.000.
Chiba, Seibi: *See*—
Sakoe, Hiroaki; and Chiba, Seibi, 4,513,435, Cl. 381-41.000.
Chickering, Kenton, III: *See*—
Hinojosa, Alberto L.; Kim, Kee; and Chickering, Kenton, III, 4,512,359, Cl. 137-315.000.
Childers, Don A. Knife blade sharpener. 4,512,111, Cl. 51-157.000.
Chodorow, Marvin, to Varian Associates, Inc. Electron tube with transverse cyclotron interaction. 4,513,223, Cl. 315-4.000.
Cholakis, Peter N., to Barry Wright Corporation. Pump impellers and manufacture thereof by co-injection molding. 4,512,720, Cl. 416-241.00A.
Cholin, John M., to Firetek Corporation. Self compensating fire detection device. 4,513,202, Cl. 250-385.000.
Choong, Tsi-Pin: *See*—
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., 4,512,179, Cl. 73-4.00R.

Chow, Kirk K. Control bar for ratchet wrench. 4,512,218, Cl. 81-62.000.
Christensen, Clad P., Jr.: *See—*
Waynant, Ronald W.; Epp, Leonard; and Christensen, Clad P., Jr., 4,513,424, Cl. 372-68.000.
Christensen, Inc.: *See—*
Aumann, James T.; and Filshtinsky, Michael, 4,512,423, Cl. 175-226.000.
Bidegaray, Dominique A., 4,512,426, Cl. 175-329.000.
Brock, Kenneth A., 4,512,425, Cl. 175-329.000.
Rowley, David S.; and Aumann, James T., 4,512,419, Cl. 175-58.000.
Christine, William C., to Trinity Associates, a Partnership of the State of Pennsylvania. Fitment attachment methods in horizontal form/fill-/seal machines. 4,512,136, Cl. 53-410.000.
Christophersen, Steven L., to Snap-on Tools Corporation. Loosening tool for tie rod sleeves. 4,512,222, Cl. 81-464.000.
Chronister, Clyde H. Fabricated ball valve. 4,512,360, Cl. 137-326.000.
Chu, Pochen; and Dwyer, Francis G., to Mobil Oil Corporation. Composite catalyst for halogenation and condensation of alkanes. 4,513,092, Cl. 502-71.000.
Chung, Harold S.; and Dickert, Joseph J., Jr., to Mobil Oil Corporation. Process for extracting bitumen from tar sands. 4,512,872, Cl. 208-11.0LE.
Chuo Hatsujyo Kabushiki Kaisha: *See—*
Aoyama, Shigetsune; Yoshikawa, Kazuo; Hasegawa, Yoshimichi; and Higuchi, Junichi, 4,512,559, Cl. 267-47.000.
Chuwman, Tsutomu; Hagino, Tetsu; and Tsuchida, Shozaburo, to Toyota Jidosha Kabushiki Kaisha. Pin-sliding caliper disc brake with boot protector. 4,512,446, Cl. 188-73.380.
Cianci, James P.; and Layton, Terry N., to Kendall Company, The. Liquid drainage system with anti-reflux valve. 4,512,770, Cl. 604-323.000.
Ciba-Geigy Corporation: *See—*
Braun, Rosalinde, 4,513,302, Cl. 346-210.000.
Rosenberger, Siegfried, 4,513,109, Cl. 524-342.000.
Schindlery, Ctibor, 4,512,987, Cl. 514-171.000.
Cimilluca, Charles I., to Irex Corporation. Time gain control signal generator for an ultrasonic diagnostic system. 4,512,350, Cl. 128-660.000.
Cincinnati Milacron Inc.: *See—*
Hennekes, Daniel M.; Kolde, Richard A.; and Suica, David E., 4,512,709, Cl. 414-729.000.
Piotrowski, Tadeusz W., 4,512,068, Cl. 29-33.00P.
Citizen Watch Company Limited: *See—*
Nakagiri, Tadahiko, 4,513,282, Cl. 340-765.000.
Claar, Terry D.; and Petri, Randy J., to Institute of Gas Technology. High-temperature direct-contact thermal energy storage using phase-change media. 4,512,388, Cl. 165-1.000.
Clapper, Millard F. Centrifugal extractor for rotary air filters. 4,512,088, Cl. 34-58.000.
Clardy, Edwin K.: *See—*
Ayers, Buell O.; and Clardy, Edwin K., 4,512,181, Cl. 73-23.100.
Clarion Co., Ltd.: *See—*
Chaki, Takao, 4,512,204, Cl. 74-10.330.
Chaki, Takao, 4,512,205, Cl. 74-10.330.
Clark, Henry S. Back-scrubber device. 4,512,054, Cl. 15-222.000.
Clark, James A.; and Gabriel, Alfred P., to Bausch & Lomb Incorporated. Actuating device for rotating shafts. 4,512,206, Cl. 74-10.540.
Clark, John T. M. Portable shower and bath mat. 4,512,044, Cl. 4-581.000.
Clark, Thomas E.; and Burilla, Charles T., to Sperry Corporation. Line emission penetration phosphor for multicolored displays. 4,513,025, Cl. 427-68.000.
Claunch, Carney P., II: *See—*
Kridl, Thomas A.; and Claunch, Carney P., II, 4,512,833, Cl. 156-94.000.
Claus, Richard O.; and Turner, Tyson M., to United States of America, National Aeronautics and Space Administration. Dual differential interferometer. 4,512,661, Cl. 356-351.000.
Clearfield, Abraham; and Jerus, Paul, to Texas A&M University System, The. Method of making sodium zirconium silico-phosphates. 4,512,905, Cl. 252-62.200.
Clemence, Francois: *See—*
Meier, Jean; and Clemence, Francois, 4,512,997, Cl. 514-383.000.
Cline, Kevin W.; and Kretschmer, Stephen L., to A. O. Smith Harvestore Products, Inc. Adjustable over-the-top agitator for a liquid manure tank. 4,512,665, Cl. 366-167.000.
Clipper, Eddie L. Game with marble agitation. 4,512,579, Cl. 273-123.00R.
Clough, Graham, to Nestec, S.A. Method of sealing a container and removing air headspace. 4,513,015, Cl. 426-396.000.
Cobb, Arnold J., to Celanese Corporation. Apparatus and process for filtering molten polymer. 4,512,731, Cl. 425-198.000.
Cohn, Arthur; and Schainker, Robert B., to Electric Power Research Institute, Inc. Method and means for recapturing coolant in a gas turbine. 4,512,715, Cl. 415-168.000.
Cole, Edward H., Jr.; and Ledvina, Timothy J., to Borg-Warner Corporation. Metal chain-belt. 4,512,754, Cl. 474-245.000.
Coleman, James H., to Sprague Electric Company. Monolithic ceramic capacitor and method for manufacturing to predetermined capacity value. 4,513,350, Cl. 361-321.000.
Coller, John H., to D. G. Shelter Products Company. Releasable latch bracket means for a vehicle sunroof. 4,512,598, Cl. 292-263.000.
Collins, Denver G., to State Industries, Inc. Water heater with combination magnetic and agitator means. 4,512,289, Cl. 122-380.000.
Collins, Donald A.; and O'Hanlan, Thomas B., to NCR Corporation. Error detecting system. 4,513,420, Cl. 371-38.000.
Collins, Patrick C., to General Electric Company. Multilayered hollow polycarbonate containers. 4,513,037, Cl. 428-35.000.
Colpaert, James J.: *See—*
Runkle, Dean E.; and Colpaert, James J., 4,512,445, Cl. 188-71.900.
Com Dev Ltd.: *See—*
Dotey, James B.; and Tang, Wai-Cheung, 4,513,264, Cl. 333-212.000.
Combustion Engineering, Inc.: *See—*
Blevins, Milton L.; and Seiter, Charles R., 4,512,178, Cl. 72-393.000.
Green, John L., 4,512,225, Cl. 83-38.000.
Commissariat a l'Energie Atomique: *See—*
Calame-Lonjean, Andre ; and Naujalis, Pierre, 4,512,203, Cl. 73-863.810.
Detriche, Jean-Marie, 4,513,195, Cl. 219-124.340.
Devaure, Bernard, 4,513,402, Cl. 367-73.000.
Communications Design Group, Inc.: *See—*
Stephens, Kenneth D., 4,513,293, Cl. 343-840.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Saulgeot, Claude, 4,512,725, Cl. 417-366.000.
Conax Corporation: *See—*
Miller, Francis M., 4,513,248, Cl. 324-439.000.
Condon, Charles E., Jr.; and Malik, J. Peter, to Torrington Company, The. Bearing cup with external restraining flange. 4,512,673, Cl. 384-569.000.
Connolly, James D. Method of removing slimes from slurries. 4,512,880, Cl. 209-250.000.
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., to Standard Oil Company (Indiana). Synthesis gas reaction iron containing active carbon catalysts. 4,513,096, Cl. 502-185.000.
Conoco Inc.: *See—*
Fenton, Jeff T., 4,513,144, Cl. 549-368.000.
Conover, William S. Linear ratchet. 4,512,217, Cl. 81-58.000.
Consolidated Papers, Inc.: *See—*
Damrau, Wayne A.; and Gauss, James C., 4,512,279, Cl. 118-411.000.
Container Corporation of America: *See—*
Lietzke, G. W., 4,512,541, Cl. 248-459.000.
Continental Disc Corporation: *See—*
Mozley, Robert M., 4,512,171, Cl. 72-55.000.
Control Data Corporation: *See—*
Logan, Max C.; and Nordstrom, Jon T., 4,512,161, Cl. 62-176.600.
Cook, Clarence E.: *See—*
Reel, Jerry R.; and Cook, Clarence E., 4,512,986, Cl. 514-170.000.
Cook, David D., Jr.: *See—*
Graham, Marshall D.; and Cook, David D., Jr., 4,513,438, Cl. 382-6.000.
Coolen, Toon, to Grays of Cambridge (Pakistan) Limited. Hockey stick having a U-shaped head. 4,512,573, Cl. 273-67.00A.
Cooper Industries Inc.: *See—*
Ambrose, Albert R.; and Fancett, Scott F., 4,512,589, Cl. 280-6.00R.
Cooper, Jack M., to General Screw Products Company. Blowdown fitting. 4,512,441, Cl. 184-105.00B.
Corbett, Lorimer J., to Medical Research (Marketing) Pty, Ltd. Method of treating navicular disease in horses. 4,513,010, Cl. 514-651.000.
Cordis Corporation: *See—*
Pohndorf, Peter J., 4,512,351, Cl. 128-786.000.
Cornelius, Edward B.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.
Cornell Research Foundation, Inc.: *See—*
Rizvi, Syed S. H.; and Gossett, Patricia W., 4,512,182, Cl. 73-64.100.
Corning Glass Works: *See—*
O'Connell, Dennis M., 4,512,666, Cl. 366-249.000.
Corrigan, Peter E.: *See—*
Moore, John T.; Corrigan, Peter E.; and Gardner, James A., 4,513,277, Cl. 340-59.000.
Corsello, Vincent G.: *See—*
Carroll, Thomas J.; Corsello, Vincent G.; Glass, Michael; and Piccolo, Dominic J., 4,513,012, Cl. 426-5.000.
Cosden Technology, Inc.: *See—*
Hahn, Granville J.; and Rutledge, Raleigh N., 4,512,395, Cl. 165-101.000.
Hahn, Granville J.; and Rutledge, Raleigh N., 4,512,943, Cl. 264-173.000.
Cosenza, Marino. Piling protector. 4,512,683, Cl. 405-216.000.
Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See—*
Pancotti, Santino; and Mariani, Renato, 4,512,717, Cl. 416-134.00A.
Cotterill, Lee A.: *See—*
Rehklau, George D.; Cotterill, Lee A.; and Langevin, Robert Z., 4,512,527, Cl. 242-56.00R.
Coulter Electronics, Inc.: *See—*
Graham, Marshall D.; and Cook, David D., Jr., 4,513,438, Cl. 382-6.000.
Coulthard, T. Lionel; Townsley, Phillip M.; and Saben, Hugh S. Method for producing fungi. 4,512,103, Cl. 47-1.100.
Courvoisier, Guy; and Arieh, Simon, to Battelle Memorial Institute. Heated seal of resiliently compressible foam for matching the edge of a hollow portion of an article to an irregular surface. 4,513,197, Cl. 219-527.000.

Coutts, Donald G.: *See*—
Boehland, Burnell G.; and Coutts, Donald G., 4,512,055, Cl. 15-249.000.
Coutures, Jean L., to Thomson-CSF. Device for detecting the presence or absence of a charge quantity and for storing the result of this detection. 4,513,211, Cl. 307-530.000.
Cowsert, Lendell E.: *See*—
Trostle, D. Mark; Kaltz, Milton C.; Moler, Ronald; and Cowsert, Lendell E., 4,512,606, Cl. 296-130.000.
Cox, Donald C., to AT&T Bell Laboratories. Time division adaptive retransmission technique for portable radio telephones. 4,513,412, Cl. 370-29.000.
Cox, Kenneth R. Stair climbing wheel chair. 4,512,588, Cl. 280-5.260.
Coy, Don R., Jr.; and Giannis, Peter M., to T/B & H Home Video. Cassette reel lock. 4,512,534, Cl. 242-198.000.
CPC International Inc.: *See*—
Keller, Frederick A., Jr.; Ganoung, Jeffrey S.; and Luenser, Susan J., 4,513,084, Cl. 435-140.000.
Crawford, James P. Induced stack draft apparatus. 4,512,264, Cl. 110-160.000.
Cricchi, James R., to Westinghouse Electric Corp. Prevention of latch-up in CMOS integrated circuits using Schottky diodes. 4,513,309, Cl. 357-42.000.
Criss, Russell C.; and Gillery, F. Howard, to PPG Industries, Inc. Stainless steel primer for sputtered films. 4,512,863, Cl. 204-192.00R.
Crist, Lee D., to AM International. Sheet handling mechanism for duplicating machine with duplexing capability. 4,512,255, Cl. 101-230.000.
Crook, Edward J., Jr., to Crosby Group, Inc., The. Load binder handle and extension therefor. 4,512,062, Cl. 24-71.00R.
Crosby Group, Inc., The: *See*—
Crook, Edward J., Jr., 4,512,062, Cl. 24-71.00R.
Cross, Danny R.: *See*—
Foust, Julian D.; Ysidro, Leonard M., Sr.; and Cross, Danny R., 4,512,701, Cl. 414-101.000.
Crossley, David W.; and Van Dore, Peter, to Mantua Metal Products Co., Inc. Model train coupler. 4,512,483, Cl. 213-75.0TC.
Crowder, Alvin L., III; Dailey, Nils L.; Fiore, Joseph V.; and Hou, Kenneth C., to AMF Incorporated. Molecular separation column and use thereof. 4,512,897, Cl. 210-656.000.
CT Harwood Limited: *See*—
Barcy, Michael F., 4,512,322, Cl. 123-549.000.
Cuisinarts, Inc.: *See*—
Williams, James E., 4,512,522, Cl. 241-37.500.
Cukelj, Mirko. Draw bar for machine tool. 4,512,696, Cl. 409-233.000.
Cummins Engine Company, Inc.: *See*—
DeVore, James R.; and Roettgen, Leslie A., 4,512,300, Cl. 123-196.0AB.
Wong, Victor W., 4,512,147, Cl. 60-274.000.
Cunningham, George F., Jr.; Lewis, John W.; McClure, Robert B.; and Poindexter, Daniel J., to International Business Machines Corporation. RF Coupling techniques. 4,512,841, Cl. 156-345.000.
D G. Shelter Products Company: *See*—
Coller, John H., 4,512,598, Cl. 292-263.000.
Dabroski, Winifred C., to Permacel. Release coating composition. 4,513,059, Cl. 428-355.000.
Dahlgren, Lars. Strung racket and tension adjusting device therefor. 4,512,576, Cl. 273-73.00R.
Dai Nippon Printing Co., Ltd.: *See*—
Kobayashi, Yuji; and Okada, Takao, 4,513,316, Cl. 358-106.000.
Daikin Kogyo Co., Ltd.: *See*—
Nakagawa, Shinichi; Ihara, Kiyohiko; and Sogabe, Toshio, 4,513,129, Cl. 526-249.000.
Dailey, Nils L.: *See*—
Crowder, Alvin L., III; Dailey, Nils L.; Fiore, Joseph V.; and Hou, Kenneth C., 4,512,897, Cl. 210-656.000.
Daimler-Benz A.G.: *See*—
Loper, Bernd, 4,512,614, Cl. 301-37.00P.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Okai, Tsukasa; and Araki, Shuichi, 4,513,444, Cl. 382-56.000.
Dairy Systems, Inc.: *See*—
Heidecker, Robert F., 4,512,096, Cl. 40-304.000.
Dalferth, Gotthilf R. Device for releasing the flow of water in a water faucet. 4,512,551, Cl. 251-339.000.
Dalke, Charles A.: *See*—
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., 4,512,179, Cl. 73-4.00R.
Dallaire, Remy; and Larouche, Claude. Ring puzzle. 4,512,582, Cl. 273-158.000.
Dalton, Susan H. Ball and track game. 4,512,578, Cl. 273-110.000.
Damrau, Wayne A.; and Gauss, James C., to Consolidated Papers, Inc. Paper coating apparatus. 4,512,279, Cl. 118-411.000.
Dancsik, Josef J. Reciprocating mechanism. 4,512,207, Cl. 74-44.000.
Daniel Industries, Inc.: *See*—
Hinojosa, Alberto L.; Kim, Kee; and Chickering, Kenton, III, 4,512,359, Cl. 137-315.000.
Danielson, Thomas R.; and Eberwine, Donald A., to Exxon Production Research Co. Moonpool guidance system for drill strings having attached umbilical lines. 4,512,408, Cl. 166-349.000.
Danielson, Thomas R.: *See*—
Gregory, Edward W.; Danielson, Thomas R.; and Eberwine, Donald A., 4,512,409, Cl. 166-352.000.
Danner, Helmut: *See*—
Thevis, Paul; and Danner, Helmut, 4,512,236, Cl. 89-128.000.
Dart Industries Inc.: *See*—
Grusin, Gerald M., 4,512,497, Cl. 220-369.000.
Das, Jagabandhu; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane ethers useful in the treatment of thrombolytic disease. 4,513,103, Cl. 514-469.000.
Data General Corporation: *See*—
Houseman, David L., 4,513,368, Cl. 364-200.000.
Ziegler, Michael L.; Marshall, Peter G.; and Whipple, David L., 4,513,372, Cl. 364-200.000.
Datacopy Corporation: *See*—
Merritt, Lauren V.; and Maclay, William R., 4,513,332, Cl. 360-77.000.
Datta, Pabitra, to RCA Corporation. Video disc molding composition. 4,512,916, Cl. 252-511.000.
Daubach, Gunter: *See*—
Franz, Reinhard; Dittmar, Wilfried; and Daubach, Gunter, 4,513,365, Cl. 364-140.000.
Davies, Robert B., to Motorola, Inc. Current ratioing device structure. 4,513,306, Cl. 357-36.000.
Davis, Charles J.: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,512,849, Cl. 162-157.200.
Davis, Delbert A.: *See*—
Leach, Jack; and Davis, Delbert A., 4,513,047, Cl. 428-175.000.
Davis, James K.: *See*—
Vanderwal, Frank E., Jr.; and Davis, James K., 4,512,116, Cl. 51-347.000.
Davis, Michael I.; Garrett, Michael J.; and Wiseman, John A., to International Business Machines Corporation. Electronic assembly with forced convection cooling. 4,513,351, Cl. 361-384.000.
Davis, Randall C.: *See*—
Jackson, L. Robert; Davis, Randall C.; and Taylor, Allan H., 4,512,699, Cl. 411-368.000.
Davis, William M.: *See*—
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; and Erwin, Lewis, 4,513,116, Cl. 525-53.000.
Davy McKee Aktiengesellschaft: *See*—
Al-Muddarris, Ghazi R., 4,513,162, Cl. 585-654.000.
Day, Gary L.; and Robertson, James P., to Firestone Tire & Rubber Company, The. Sulfur-curable rubber skim stock compositions containing dithiodipropionic acid. 4,513,123, Cl. 525-332.600.
Deborde, Albert H.; and Remond, Pierre, to Saurer Diederichs Societe Anonyme. System for alternately inserting different weft yarns into the shed of a jet loom. 4,512,375, Cl. 139-435.000.
Dechelette, Helen, to Molex Incorporated. Insulation displacement terminal for an electrical connector and environmental sealing means therefor, 4,512,619, Cl. 339-94.00M.
Deckman, Harry W.; and Dunsmuir, John H., to Exxon Research and Engineering Co. Procedure for fabrication of microstructures over large areas using physical replication. 4,512,848, Cl. 156-630.000.
de Courten, Alfred; Schulthess, Adrian; and Esteve-Soler, Jose , to Laboratoires OM SA. Method for treating heart disease. 4,513,007, Cl. 514-555.000.
Deere & Company: *See*—
Kaesser, Merle L., 4,512,714, Cl. 415-151.000.
Kuhn, John B.; and Lange, Henry J., 4,512,414, Cl. 172-112.000.
DeGood, Robert L.; and Malcolm, Eddie R., to Fike Metal Products Corporation. Dual range rupture disc assembly. 4,512,491, Cl. 220-89.00A.
De Grave, Isidoor: *See*—
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,513,105, Cl. 521-56.000.
Dekker, Cornelis B.; and Vries, Lodewijk B., to U.S. Philips Corporation. Community antenna television arrangement for the reception and distribution of TV - and digital audio signals. 4,513,315, Cl. 358-86.000.
Delang, Theodore G. Surgical instrument organizer. 4,512,466, Cl. 206-370.000.
De Lima Castro Netto, Eduardo. Security sealing system. 4,512,599, Cl. 292-307.00R.
Delluc, Rene E. Tubular vacuum-tight enclosures for thermal and acoustical insulating panels. 4,513,041, Cl. 428-69.000.
Delman, Dennis J., to Harris Corporation. Hardware median filter. 4,513,440, Cl. 382-30.000.
De Loach, Walter W. Closed loop water treating system. 4,512,784, Cl. 55-196.000.
Del Serra, David I., to Hughes Tool Company. Anti-rotation motor bearing. 4,513,215, Cl. 310-90.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lee, Seok-Ho, to Wisconsin Alumini Research Foundation. 1,23-Dihydroxyvitamin D compounds. 4,512,925, Cl. 260-397.200.
Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,513,147, Cl. 562-506.000.
Denance, Raymond. Apparatus for performing intradermal, subcutaneous of intramuscular injections. 4,512,767, Cl. 604-137.000.
DeNicolo, William; and Nakada, Pershing. Method and device for selective separation of fine metal particles. 4,512,760, Cl. 494-37.000.
Dennis, Mark S.; Estell, David A.; and Light, David R., to Genentech, Inc. Method for overcoming trypsin inhibition. 4,512,973, Cl. 424-94.000.
Dennis, Patrick W.: *See*—
Lefevre, Donald K.; Dennis, Patrick W.; and Seegmiller, Dennis F., 4,513,290, Cl. 343-745.000.
Densen, Mark S. Readily erectable wardrobe cabinet and a mode of packaging the same. 4,512,477, Cl. 206-577.000.

Dente, Mario: *See—*
Robinson, Lee F.; Salimbeni, Francesco; Porcari, Guiliano; and Dente, Mario, 4,512,956, Cl. 422-270.000.

Dentistry Researchers & Designers, Inc.: *See—*
Michnick, Bruce T.; and Kitzis, Stanley, 4,512,744, Cl. 433-229.000.

DePakh, Stephan. Emission control device. 4,512,325, Cl. 123-572.000.

Derimiggio, John, to Eastman Kodak Company. Fuser apparatus. 4,512,649, Cl. 355-3.0FU.

DeSoto, Inc.: *See—*
Larkins, Bruce T., 4,512,330, Cl. 126-139.000.

Detriche, Jean-Marie, to Commissariat a l'Energie Atomique. Method and apparatus for the lateral positioning of a member relative to a joint. 4,513,195, Cl. 219-124.340.

Deulofeu, Jorge Magri. System of articulated legs for toy figures. 4,512,749, Cl. 446-390.000.

Deutsche Babcock Aktiengesellschaft: *See—*
Buchmuller, Horst; and Michelbrink, Bernhard, 4,512,265, Cl. 110-171.000.

Deutsche Perlite GmbH: *See—*
Wader, Heribert, 4,512,736, Cl. 432-58.000.

Devaure, Bernard, to Commissariat a l'Energie Atomique. Earthquake simulator. 4,513,402, Cl. 367-73.000.

Devchoudhury, Rathindra N., to NCR Corporation. ROM security circuit. 4,513,389, Cl. 364-900.000.

Devienne, Jules H. P., to Societe Nationale Industrielle et Aerospatiale. Device for maintaining a detonating cord against a transparent aircraft canopy member. 4,512,538, Cl. 244-122.0AF.

Devins, John C., to General Electric Company. Means to improve the dielectric performance of an insulative conduit with a flow of liquid dielectric coolant therein. 4,513,346, Cl. 361-212.000.

DeVore, James R.; and Roettgen, Leslie A., to Cummins Engine Company, Inc. Oil temperature control system for internal combustion engine. 4,512,300, Cl. 123-196.0AB.

Dewhurst, Alan, to Dewhurst & Partner P.L.C. Lift door control apparatus. 4,512,443, Cl. 187-57.000.

Dewhurst & Partner P.L.C.: *See—*
Dewhurst, Alan, 4,512,443, Cl. 187-57.000.

Dey, Arabinda N.: *See—*
Kuo, Han C.; Foster, Donald L.; Schlaikjer, Carl R.; Gopikanth, Mysore L.; and Dey, Arabinda N., 4,513,067, Cl. 429-101.000.

Deyer, Craig E., to RCA Corporation. System for providing a multi-bit input to a computer controlled system. 4,513,394, Cl. 364-900.000.

Dheur, Raymond J., to Fabrique Nationale Herstal. Pocket pistol. 4,512,100, Cl. 42-70.00A.

Dias, Francisco J.: *See—*
Struck, Bernd D.; Dias, Francisco J.; Luhleich, Hartmut; and Paffen nee Siebert, Ursula, 4,512,858, Cl. 204-104.000.

Diaz, Gerard J.: *See—*
McLaughlin, Thomas F.; and Diaz, Gerard J., 4,512,092, Cl. 40-2.00R.

Dicke, William C., to Singer Company, The. Pilot adaptor for flat wood boring bits. 4,512,691, Cl. 408-201.000.

Dickert, Joseph J., Jr.: *See—*
Chung, Harold S.; and Dickert, Joseph J., Jr., 4,512,872, Cl. 208-11.0LE.

Dickson, Edward J.; and Armstrong, Richard J., to Dickson, Edward John. Tape cassette with clutch assembly. 4,512,535, Cl. 242-200.000.

Dickson, Edward John: *See—*
Dickson, Edward J.; and Armstrong, Richard J., 4,512,535, Cl. 242-200.000.

Dickson, James; and Hays, Charles, to Allied Corporation. Platelet metal powder for coating a substrate. 4,513,020, Cl. 427-34.000.

Didier Engineering GmbH: *See—*
Wagener, Dietrich; and Blase, Manfred, 4,512,080, Cl. 33-125.00T.

Dieringer, Bruce G., to Allied Corporation. Dynamoelectric machine. 4,513,214, Cl. 310-71.000.

Dietrich, Paul: *See—*
Escher, Sina D.; and Dietrich, Paul, 4,512,352, Cl. 131-276.000.

Dills, Reuben H. Adhesive tape tab. 4,512,462, Cl. 206-53.000.

Dinelli, Dino: *See—*
Gervasio, Vincenzo; and Dinelli, Dino, 4,513,206, Cl. 290-4.00C.

Dines, David R.; and Webb, Vertis C., to AT&T Technologies, Inc. System for loading and dispensing articles from a magazine. 4,512,707, Cl. 414-404.000.

Dionex Corporation: *See—*
Mar, Dav, 4,512,545, Cl. 251-4.000.

Dittmar, Wilfried: *See—*
Franz, Reinhard; Dittmar, Wilfried; and Daubach, Gunter, 4,513,365, Cl. 364-140.000.

Dittrich, Horst. Yarn limiting disc device. 4,512,532, Cl. 242-116.000.

Dr. Johannes Heidenhain GmbH: *See—*
Burkhardt, Horst, 4,512,082, Cl. 33-125.00R.
Ernst, Alfons; and Brunner, Arthur, 4,512,184, Cl. 73-116.000.
Schmitt, Walter; and Michel, Dieter, 4,512,083, Cl. 33-143.00L.

Doi, Shigeru: *See—*
Munekata, Kenichi; Doi, Yoshio; Suzuki, Isao; and Doi, Shigeru, 4,513,366, Cl. 364-167.000.

Doi, Yoshio: *See—*
Munekata, Kenichi; Doi, Yoshio; Suzuki, Isao; and Doi, Shigeru, 4,513,366, Cl. 364-167.000.

Dolejs, Anthony H.: *See—*
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,513,439, Cl. 382-7.000.

Domaas, Perry M.: *See—*
Kaster, Robert L.; and Domaas, Perry M., 4,512,471, Cl. 206-438.000.

Dominguez, Richard J. G., to Texaco Inc. Reaction injection molded elastomers containing low molecular weight organic acids. 4,513,133, Cl. 528-49.000.

Domnanovich, James R.; and Erwin, William D., to Siemens Gammasonics, Inc. Housing for a radioactive source. 4,513,204, Cl. 250-496.100.

Donaldson Company, Inc.: *See—*
Fischer, Paul M.; and Schwarz, Carl E., 4,512,882, Cl. 210-86.000.
Wright, Mervin E.; and Gronholz, Donald D., 4,512,891, Cl. 210-445.000.

Donohue, Paul C., to Du Pont de Nemours, E. I., and Company. Hexaboride resistor composition. 4,512,917, Cl. 252-521.000.

Donovan Wire & Iron: *See—*
Gurney, Anthony R., 4,512,210, Cl. 74-535.000.

Dorey, James B.; and Tang, Wai-Cheung, to Com Dev Ltd. Bandpass filter with plurality of wave-guide cavities. 4,513,264, Cl. 333-212.000.

Doroszkowski, Andrew, to Imperial Chemical Industries PLC. Electrophoretic coating process. 4,512,861, Cl. 204-181.00R.

Dorr-Oliver: *See—*
Klinkowski, Peter R., 4,513,032, Cl. 427-336.000.

Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, to Kraftwerk Union Aktiengesellschaft; and Reaktor Brennelement Union GmbH. Method for manufacturing oxidic sintered nuclear fuel bodies. 4,512,939, Cl. 264-0.500.

Dougherty, Timothy S.: *See—*
Astfalk, Greg; Dougherty, Timothy S.; and Viriyayuthakorn, Montri, 4,512,944, Cl. 264-174.000.

Doughty, Dennis J.: *See—*
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,513,268, Cl. 335-35.000.

Doulton, Romm; and Chapman, Robert A. Portable information device having an output related to natural physical events. 4,512,667, Cl. 368-10.000.

Dow Chemical Company, The: *See—*
Greenawalt, Eddie L., 4,512,138, Cl. 53-451.000.
Hoffman, Dwight K., 4,513,124, Cl. 525-452.000.

Dowty Mining Equipment Limited: *See—*
Waters, John H., 4,512,686, Cl. 405-293.000.

Drabowitch, Serge, to Thomson-CSF. Waveguide having radiating slots and a wide frequency band. 4,513,291, Cl. 343-771.000.

Drain, Robert E., to Montana Power Company, The. Power transmission line protective apparatus. 4,513,340, Cl. 361-62.000.

Dravo Corporation: *See—*
Manning, Edward T., Jr.; and Horan, Grant S., 4,512,260, Cl. 104-252.000.

Dreckmann, Karl, to M. Lehmacher & Sohn GmbH Maschinenfabrik. Double-seam bag-making method and apparatus with offset stacking. 4,512,757, Cl. 493-194.000.

Dresser Industries, Inc.: *See—*
Moore, Leslie B., 4,512,669, Cl. 384-93.000.
Snyder, Warren E., 4,512,304, Cl. 123-344.000.

Dronet, Jean-Marc; and Resseguier, Jacques, to Ste d'Application Platique Mecanique et Electronicque Plastimechanique S.A. Arrangement for externally affixing or placing banderoles or strips on receptacles. 4,512,734, Cl. 425-305.100.

Drumm, Philip R. Unsinkable all-purpose boat. 4,512,275, Cl. 114-39.000.

Drzewiecki, Tadeusz M.; Toda, Kenji; and Gurney, John, to United States of America, Army. Photofluidic interface. 4,512,371, Cl. 137-828.000.

Duboeuf, Jean-Paul: *See—*
Vernois, Michel; and Duboeuf, Jean-Paul, 4,513,056, Cl. 428-264.000.

Dubowicz, Palemon W.: *See—*
Goodall, Steve R.; Dubowicz, Palemon W.; and Campbell, Donn V., 4,513,338, Cl. 361-1.000.

Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., to Burroughs Wellcome Co. Treatment with dialkoxy pyridopyrimidine compounds. 4,512,992, Cl. 514-258.000.

Duhl, David N.; Chen, Otis Y.; and Gell, Maurice L., to United Technologies Corporation. Method for producing corrosion resistant high strength superalloy articles. 4,512,817, Cl. 148-3.000.

Dulken, Hartmut; Kassel, Karlheinz; Mows, Wolfgang; and Walsdorfer, Hubert, to Licentia Patent-Verwaltungs-GmbH. Dual layer electrophotographic recording material containing a layer of selenium, arsenic and halogen, and thereabove a layer of selenium and tellurium. 4,513,072, Cl. 430-57.000.

Dunham, David A.; Riggs, Robert P.; and Burton, Rufus L., Jr., to Red Fox Industries, Inc. Jack-up unit. 4,512,553, Cl. 254-89.00R.

Dunleavy, James E., Jr., to Eastman Kodak Company. Collating document feeder and reproduction apparatus having copy duplexing capabilities. 4,512,651, Cl. 355-14.0SH.

Dunn, Aubrey J., to United States of America, Army. X-Ray reflective optical elements. 4,513,434, Cl. 378-85.000.

Dunphy, Gerald F.; and Newman, Donald J., to Ogden Industries Pty. Ltd. Cylinder lock and key. 4,512,166, Cl. 70-366.000.

Dunsmuir, John H.: *See—*
Deckman, Harry W.; and Dunsmuir, John H., 4,512,848, Cl. 156-630.000.

Du Pont de Nemours, E. I., and Company: *See—*
Donohue, Paul C., 4,512,917, Cl. 252-521.000.
Linder, Karen E., 4,512,967, Cl. 424-1.100.

Mazur, Stephen, 4,512,855, Cl. 204-22.000.
Uschold, Ronald E., 4,513,128, Cl. 526-212.000.
Vasta, Joseph A., 4,513,060, Cl. 428-416.000.
Duracell Inc.: *See—*
Kuo, Han C.; Foster, Donald L.; Schlaikjer, Carl R.; Gopikanth, Mysore L.; and Dey, Arabinda N., 4,513,067, Cl. 429-101.000.
Durofac-Kartro A/S: *See—*
Nielsen, Mogens B., 4,512,692, Cl. 408-226.000.
Dwyer, Francis G.: *See—*
Chu, Pochen; and Dwyer, Francis G., 4,513,092, Cl. 502-71.000.
Dymek Corporation: *See—*
Young, Ronald E.; and Meulners, Duane C., 4,513,333, Cl. 360-77.000.
Dynamit Nobel AG: *See—*
Kummer, Peter; and Rehfeld, Gerhard, 4,513,089, Cl. 501-103.000.
Dysan Corporation: *See—*
Baker, Bradley D.; and Kelly, Richard L., 4,513,331, Cl. 360-75.000.
E. R. Squibb & Sons, Inc.: *See—*
Das, Jagabandhu; and Haslanger, Martin F., 4,513,103, Cl. 514-469.000.
Weller, Harold N., III; Gordon, Eric M.; Karanewsky, Donald S.; and Ryono, Denis E., 4,512,988, Cl. 514-211.000.
Eagar, Thomas W.: *See—*
Barringer, Eric A.; and Eagar, Thomas W., 4,512,822, Cl. 148-24.000.
Earl, Webster B., to Fairchild Industries, Inc. Pressure transducer. 4,512,357, Cl. 137-82.000.
Eastin, John A. Manufacturing and using nitrogen fertilizer solutions on a farm. 4,512,794, Cl. 71-54.000.
Eastman Kodak Company: *See—*
Blanding, Douglass L.; and Muszak, Martin F., 4,512,952, Cl. 422-63.000.
Chen, Tsang J., 4,512,969, Cl. 424-81.000.
Derimiggio, John, 4,512,649, Cl. 355-3.0FU.
Dunleavy, James E., Jr., 4,512,651, Cl. 355-14.0SH.
Kocher, Haribhajan S., 4,512,650, Cl. 355-3.0FU.
Mey, William, 4,513,071, Cl. 430-19.000.
Ng, Yee S.; Jarvis, James G.; and Thompson, John R., 4,512,653, Cl. 355-16.000.
Eaton Corporation: *See—*
Ryczek, Lawrence J., 4,513,343, Cl. 361-101.000.
Ebara Corporation: *See—*
Oshima, Masao; Kato, Yutaka; Ogasawara, Mitsuhiko; and Futamura, Osamu, 4,512,936, Cl. 261-93.000.
Ebara-Infilco Co., Ltd.: *See—*
Oshima, Masao; Kato, Yutaka; Ogasawara, Mitsuhiko; and Futamura, Osamu, 4,512,936, Cl. 261-93.000.
Eberle, Jurg: *See—*
Reist, Walter; and Eberle, Jurg, 4,512,457, Cl. 198-479.000.
Eberly, Paul E., Jr.; and Winter, William E., Jr., to Exxon Research and Engineering Co. Crystalline silica zeolite-containing catalyst. 4,513,090, Cl. 502-66.000.
Eberwine, Donald A.: *See—*
Danielson, Thomas R.; and Eberwine, Donald A., 4,512,408, Cl. 166-349.000.
Gregory, Edward W.; Danielson, Thomas R.; and Eberwine, Donald A., 4,512,409, Cl. 166-352.000.
Echte, Adolf: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,513,105, Cl. 521-56.000.
Eckenrode, Paul D.; Eisenbrei, Richard P.; and Nixon, James E., to Microdot Inc. Bottom pour ingot mould system. 4,512,544, Cl. 249-109.000.
Eckert, Joachim: *See—*
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Economics Laboratory, Inc.: *See—*
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Edgren, Anders; Soderberg, Jan; and Bergstrom, Bengt, to KemaNord AB. Process for expanding microspheres. 4,513,106, Cl. 521-58.000.
Edlund, Olof A.; Enser, Mats A.; Strage, Jan W.; Thunberg, Svante B.; and Wallmark, Erik I., to International Business Machines Corporation. Document handling terminal computer. 4,513,393, Cl. 364-900.000.
Edwards, Bruce K., to Location Sample Service, Inc. Drill rate and gas monitoring system. 4,512,186, Cl. 73-151.500.
Edwards, Philip L. Chewable toy for animal. 4,513,014, Cl. 426-132.000.
Egan, John J.; and Witkowski, Andrew B., to International Harvester Company. Automotive engine with improved multifilter lubrication system. 4,512,299, Cl. 123-196.00A.
Eggert, Stig: *See—*
Nabb, Elis; and Eggert, Stig, 4,512,597, Cl. 292-143.000.
Eguchi, Shusaku: *See—*
Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,512,911, Cl. 252-301.40H.
Eheim, Franz: *See—*
Hofer, Gerald; Straubel, Max; and Eheim, Franz, 4,512,308, Cl. 123-383.000.
Ehrhardt, Henry B. Tracking trailer construction. 4,512,593, Cl. 280-460.00R.
Eichelberger, John L.: *See—*
Chen, Johnson C. H.; and Eichelberger, John L., 4,513,053, Cl. 428-221.000.
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Eichlseder, Martin; and Burkle, Erwin, to Krauss-Maffei Aktiengesellschaft. Adjustable injection molding backflow preventer. 4,512,733, Cl. 425-207.000.
Eisai Co., Ltd.: *See—*
Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; Saito, Isao; and Kitoh, Kyosuke, 4,513,145, Cl. 549-402.000.
Eisenbrei, Richard P.: *See—*
Eckenrode, Paul D.; Eisenbrei, Richard P.; and Nixon, James E., 4,512,544, Cl. 249-109.000.
Elco Corporation: *See—*
Tillotson, John D., 4,512,620, Cl. 339-97.00P.
Elcott, Teleb M. Fluid pulsation apparatus. 4,512,514, Cl. 239-99.000.
Elder, Michael G.: *See—*
Bennett, Gloria A.; Elder, Michael G.; and Kemme, Joseph E., 4,513,352, Cl. 361-385.000.
Eldon Industries, Inc.: *See—*
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Electric Power Research Institute, Inc.: *See—*
Cohn, Arthur; and Schainker, Robert B., 4,512,715, Cl. 415-168.000.
Electro-Sound, Inc.: *See—*
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Electronic Data Systems Corporation: *See—*
Sheets, Duane R., 4,513,373, Cl. 364-200.000.
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Money, David K., 4,513,212, Cl. 307-575.000.
Eli Lilly and Company: *See—*
Fayerman, Jeffrey T.; and Richardson, Mark A., 4,513,086, Cl. 435-317.000.
Nakatsukasa, Walter M.; and Mabe, James A., 4,513,085, Cl. 435-253.000.
Wong, David T.; and Lacefield, William B., 4,513,135, Cl. 544-120.000.
Elkus, Eugene S.: *See—*
Sidline, George B., 4,513,199, Cl. 235-449.000.
Ellett, Kenneth W.; and Glutz, Peter, to Small Precision Tools, Inc. Protection of semiconductor wire bonding capillary from spark erosion. 4,513,190, Cl. 219-56.210.
Ellis, Roland, Jr.; Jacobs, Brian E.; March, Edward J.; and Newman, Raymond J., to AT&T Technologies, Inc. Technique for bonding a chip carrier to a metallized substrate. 4,512,509, Cl. 228-180.200.
Endoh, Kazunori; and Suzuki, Haruo, to Jidosha Kiki Co., Ltd. Tandem type brake power servo booster. 4,512,237, Cl. 91-369.00A.
Engel, Christopher M.: *See—*
Reneau, Daniel L.; Tzakis, George J.; and Engel, Christopher M., 4,513,320, Cl. 358-166.000.
Engelbrecht & Lemmerbrock GmbH & Co.: *See—*
Johanning, Hermann, 4,512,521, Cl. 241-34.000.
Engelhard Corporation: *See—*
Adlhart, Otto J., 4,513,065, Cl. 429-19.000.
Engelhardt, Billy M.; and Moore, Dwane L., to Jamieson Film Company. Film processor tank with tank divider. 4,512,645, Cl. 354-324.000.
Engelke, Helmut: *See—*
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., 4,513,203, Cl. 250-491.100.
England, Robert C. Device for inserting and removing contact lenses. 4,512,602, Cl. 294-1.200.
Enns, Silvanus T. Conveyor assemblies for detachable mounting to a tractor. 4,512,687, Cl. 406-41.000.
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Edlund, Olof A.; Enser, Mats A.; Strage, Jan W.; Thunberg, Svante B.; and Wallmark, Erik I., 4,513,393, Cl. 364-900.000.
Enthone, Incorporated: *See—*
Paneccasio, Vincent, 4,512,856, Cl. 204-55.00R.
Epp, Leonard: *See—*
Waynant, Ronald W.; Epp, Leonard; and Christensen, Clad P., Jr., 4,513,424, Cl. 372-68.000.
Equipements Automobiles Marchal: *See—*
Wattier, Maurice F., 4,512,056, Cl. 15-250.230.
Erani, Homi K. Saddle assembly. 4,512,608, Cl. 297-201.000.
Erdman, David M., to General Electric Company. Laundering apparatus, method of operating a laundry machine, control system for an electronically commutated motor, and method of operating an electronically commutated motor. 4,513,230, Cl. 318-254.000.
Erickson, Charles D., to Getty Oil Company. Flow rate control and metering means for shear-sensitive liquids. 4,512,188, Cl. 73-198.000.
Erickson, James R.: *See—*
Abbey, Kirk J.; Erickson, James R.; and Kunz, Barbara L., 4,512,860, Cl. 204-181.00C.
Eriksson, Lars E.; and Rickardsson, Gote, to Eriksson, Lars Erik. Elements for supporting and bracing sealed-glazing units. 4,512,125, Cl. 52-209.000.
Eriksson, Lars Erik: *See—*
Eriksson, Lars E.; and Rickardsson, Gote, 4,512,125, Cl. 52-209.000.
Ernest, Michael V.: *See—*
Peters, Alan W.; Kim, Gwan; and Ernest, Michael V., 4,513,101, Cl. 502-304.000.

Ernst, Alfons; and Brunner, Arthur, to Dr. Johannes Heidenhain GmbH. Mounting arrangement for angle measuring device. 4,512,184, Cl. 73-116.000.
Ernst, Bruce H.; Howard, Dennis D.; and Gismondi, Thomas E., to Lord Corporation. High build, ambient cure coating compositions. 4,513,112, Cl. 524-590.000.
Ernst, Richard R., to Spectrospin AG. Method for recording three-dimensional nuclear magnetic resonance spectra and a device for carrying out the same. 4,513,247, Cl. 324-309.000.
Erwin, Lewis: *See*—
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; and Erwin, Lewis, 4,513,116, Cl. 525-53.000.
Erwin, William D.: *See*—
Domnanovich, James R.; and Erwin, William D., 4,513,204, Cl. 250-496.100.
Escher, Gert; Holighaus, Rolf; and Wenning, Hans-Peter, to Veba Oel Entwicklungs-Gesellschaft mbH. Process for low temperature carbonization of hydrogenation residues. 4,512,873, Cl. 208-13.000.
Escher, Sina D.; and Dietrich, Paul, to Firmenich SA. Use of 4-methyl-2-hydroxy-benzaldehyde to improve the flavor characteristics of tobacco. 4,512,352, Cl. 131-276.000.
Esmay, Donald L., to Minnesota Mining and Manufacturing Company. Composite of separable pressure-sensitive adhesive tapes. 4,513,039, Cl. 428-40.000.
Estang, Bernard, to Thomson-CSF. System for equilibrating an imbalance couple and use of such a system for equilibrating an airborne radar antenna. 4,512,448, Cl. 188-378.000.
Estell, David A.: *See*—
Dennis, Mark S.; Estell, David A.; and Light, David R., 4,512,973, Cl. 424-94.000.
Esteve-Soler, Jose : *See*—
de Courten, Alfred; Schulthess, Adrian; and Esteve-Soler, Jose , 4,513,007, Cl. 514-555.000.
Etani, Kenji. Apparatus for water treatment. 4,512,955, Cl. 422-266.000.
Ethyl Corporation: *See*—
Chen, Jackson C., 4,512,775, Cl. 44-62.000.
Jones, Jesse D., 4,513,108, Cl. 524-180.000.
Nelson, Gunner E., 4,512,966, Cl. 423-644.000.
Etou, Kazumi; and Komoto, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerator. 4,512,162, Cl. 62-298.000.
Ettinger, Donald H., to USM Corporation. Automatic stud welding equipment with fluid and stud feeding. 4,513,193, Cl. 219-98.000.
Eurotungstene: *See*—
Allard, Joseph, 4,512,612, Cl. 299-91.000.
Evenson, Mel, to Eldon Industries, Inc. Article holding device. 4,512,480, Cl. 211-11.000.
Everest & Jennings, Inc.: *See*—
Nassiri, Joe-Massoud, 4,512,613, Cl. 301-1.000.
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Process for augmenting or enhancing aroma of consumable material by adding thereto 1,2,3,3,5,6-hexamethyl-bicyclo[2.2.2]-oct-5-en-2-ol. 4,512,902, Cl. 252-8.600.
Exploration Logging, Inc.: *See*—
Troy, George W., 4,513,403, Cl. 367-83.000.
Exxon Production Research Co.: *See*—
Danielson, Thomas R.; and Eberwine, Donald A., 4,512,408, Cl. 166-349.000.
Gregory, Edward W.; Danielson, Thomas R.; and Eberwine, Donald A., 4,512,409, Cl. 166-352.000.
Exxon Research and Engineering Co.: *See*—
Deckman, Harry W.; and Dunsmuir, John H., 4,512,848, Cl. 156-630.000.
Eberly, Paul E., Jr.; and Winter, William E., Jr., 4,513,090, Cl. 502-66.000.
Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; and Erwin, Lewis, 4,513,116, Cl. 525-53.000.
Lundberg, Robert D., 4,512,776, Cl. 44-62.000.
Mauldin, Charles H., 4,513,161, Cl. 585-640.000.
Reid, Lloyd E.; Yao, Keith C.; and Ryan, Douglas G., 4,512,878, Cl. 208-179.000.
Wright, Franklin J.; Richard, Michael A.; and Pirkle, James C., 4,513,104, Cl. 518-714.000.
Eyre, Steven C. Safety ski binding. 4,512,594, Cl. 280-614.000.
Ezawa, Sadaaki; and Kitagawa, Hiroshi, to Kawai Musical Instrument Mfg. Co., Ltd. Electronic musical instrument. 4,512,230, Cl. 84-1.240.
F. L. Smidth & Co. A/S: *See*—
Jensen, Torkil D., 4,512,458, Cl. 198-507.000.
Fabbrini, Charles J., to Minnesota Mining and Manufacturing Company. Thermally transferable ink compositions. 4,513,107, Cl. 524-56.000.
Fabrique Nationale Herstal: *See*—
Dheur, Raymond J., 4,512,100, Cl. 42-70.00A.
Facit Aktiebolag: *See*—
Johansson, Hans L., 4,512,676, Cl. 400-144.200.
Fairbanks, David W., to RCA Corporation. Pickup cartridge having stylus holder. 4,513,410, Cl. 369-126.000.
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Vora, Madhukar B., 4,512,075, Cl. 29-577.00C.
Fairchild Industries, Inc.: *See*—
Earl, Webster B., 4,512,357, Cl. 137-82.000.
Falk, Ernst; and Knosel, Johann, to Richard Wolf GmbH. Medical coagulation device. 4,512,343, Cl. 128-303.170.
Falk, R. Aaron, to Ball Corporation. Thermocouple detector. 4,513,201, Cl. 250-342.000.
Falkenroth, Heinz-Jurgen: *See*—
Mahler, Gert; Falkenroth, Heinz-Jurgen; Leitermann, Wulf; and Boms, Manfred, 4,512,240, Cl. 98-2.040.
Fancett, Scott F.: *See*—
Ambrose, Albert R.; and Fancett, Scott F., 4,512,589, Cl. 280-6.00R.
Farag, Samir F.; Allen, Edgar W.; and Little, Thomas R., to Siemens-Allis, Inc. Circuit breaker operator and interlock. 4,513,180, Cl. 200-50.00R.
Farrow, John F., to Medar, Inc. Structure for and method of reducing impedance in multiphase direct current power supplies. 4,513,363, Cl. 363-126.000.
Fasano, Michael: *See*—
Carney, William V.; and Fasano, Michael, 4,512,622, Cl. 339-103.00M.
Fattore, Vittorio; Notari, Bruno; Paggini, Alberto; and Lagana , Vincenzo, to Snamprogetti S.p.A. Catalytic system for producing mixtures of methanol and higher alcohols. 4,513,100, Cl. 502-303.000.
Faulkner, James V., Jr., to Westinghouse Electric Corp. Electric utility automated distribution apparatus with improved data display. 4,513,382, Cl. 364-492.000.
Faure, Michel; Regeffe, Jean Y.; Lumineau, Yves; and Jouanin, Andre , to Lignes Telegraphiques & Telephoniques. Rotary sealing device. 4,512,790, Cl. 65-13.000.
Fayerman, Jeffrey T.; and Richardson, Mark A., to Eli Lilly and Company. Cloning vectors for use in streptomyces and related organisms. 4,513,086, Cl. 435-317.000.
Fechant, Louis: *See*—
Belbel, Elie; Blanchard, Christian; Lauraire, Michel; Fechant, Louis; and Haury, Andre , 4,513,270, Cl. 335-195.000.
Feder, Friedhelm R., to Wedco Incorporated. Heat treating of material in finely divided form. 4,512,732, Cl. 425-222.000.
Federighi, Alberto. Single or multiple dose container-closure assemblies. 4,512,475, Cl. 206-484.000.
Feinwerktecnik Schleicher & Co., Firma: *See*—
Goldhammer, Albert, 4,512,252, Cl. 100-53.000.
Feitzinger, Eduard; and Seminski, Robert B., to R.Q.O. Holding Company. Controlling ammonia emissions for diazo developing equipment. 4,512,654, Cl. 355-27.000.
Fenton, Jeff T., to Conoco Inc. Acetal purification with superoxides. 4,513,144, Cl. 549-368.000.
Ferag AG: *See*—
Reist, Walter; and Eberle, Jurg, 4,512,457, Cl. 198-479.000.
Fernbacher, John M.: *See*—
Santangelo, Joseph G.; and Fernbacher, John M., 4,512,403, Cl. 166-261.000.
Ferrara-Jordan, Elisa M.: *See*—
Anderson, Donald G.; and Ferrara-Jordan, Elisa M., 4,513,294, Cl. 346-33.0ME.
Fiat Auto S.p.A.: *See*—
Boccalatte, Vitale, 4,512,869, Cl. 204-300.0EC.
Ficht GmbH: *See*—
Ficht, Reinhold; and Schindler, Manfred, 4,512,290, Cl. 123-56.0BC.
Ficht, Reinhold; and Schindler, Manfred, to Ficht GmbH. Crank guide assembly for internal combustion engines, in particular two-stroke internal combustion engines with facing cylinders. 4,512,290, Cl. 123-56.0BC.
Fieberg, Donald E.: *See*—
Fieberg, Russell F.; and Fieberg, Donald E., 4,512,071, Cl. 29-278.000.
Fieberg, Russell F.; and Fieberg, Donald E., to Russtech Engineering Company, Inc. Tool holder. 4,512,071, Cl. 29-278.000.
Field, Harold; and Richter, Robert E., to Motorola, Inc. Auxiliary battery charging terminal. 4,513,068, Cl. 429-121.000.
Fields, Willie M., to Mead Corporation, The. Apparatus for feeding from a hopper and for setting up collapsed article carriers. 4,512,756, Cl. 493-312.000.
Figgie International: *See*—
Robinson, Mary K.; and Probst, Timothy F., 4,512,134, Cl. 53-248.000.
Fike Metal Products Corporation: *See*—
DeGood, Robert L.; and Malcolm, Eddie R., 4,512,491, Cl. 220-89.00A.
Filliman, Paul, to RCA Corporation. Switching network with suppressed switching transients. 4,513,322, Cl. 358-181.000.
Film Cooling Towers Limited: *See*—
Jones, Bryan E.; and Kunesch, Anthony M., 4,512,938, Cl. 261-112.000.
Filshtinsky, Michael: *See*—
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Fiore, Joseph V.: *See*—
Crowder, Alvin L., III; Dailey, Nils L.; Fiore, Joseph V.; and Hou, Kenneth C., 4,512,897, Cl. 210-656.000.
Firestone Tire & Rubber Company, The: *See*—
Day, Gary L.; and Robertson, James P., 4,513,123, Cl. 525-332.600.
Tomaszewski, Walter, 4,512,680, Cl. 403-313.000.
Firetek Corporation: *See*—
Cholin, John M., 4,513,202, Cl. 250-385.000.
Firmenich SA: *See*—
Escher, Sina D.; and Dietrich, Paul, 4,512,352, Cl. 131-276.000.
Firmin, Richard: *See*—
Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, 4,512,349, Cl. 128-632.000.

Fischer, Artur. High-pressure packing device for injecting synthetic resin into cracks in concrete. 4,512,123, Cl. 52-173.00R.

Fischer, Emil, to Albert-Frankenthal AG. System for the supply of staple wire to a stapler. 4,512,506, Cl. 227-5.000.

Fischer, Paul M.; and Schwarz, Carl E., to Donaldson Company, Inc. Single-ended, spin-on fuel water separator. 4,512,882, Cl. 210-86.000.

Fischer, Rolf; Weitz, Hans-Martin; and Siegel, Hardo, to BASF Aktiengesellschaft. Preparation of but-2-ene-1,4-diones substituted in the 1,4-positions. 4,513,150, Cl. 568-385.000.

Flachglas Aktiengesellschaft: *See*—
Bartelsen, Lutz; and Neuendorf, Hans-Cristoph, 4,513,196, Cl. 219-203.000.

Flakt Aktiebolag: *See*—
Widerby, Lennart, 4,512,356, Cl. 137-75.000.

Flatau, Carl R., to Textron Inc. Robot forearm. 4,512,710, Cl. 414-735.000.

Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, to SPOFA, spojene podniky pro zdravotnickou vyrobu. Luteinizing and follicle stimulating hormones and process for the preparation thereof. 4,512,923, Cl. 260-112.5LH.

Fleming, James W., to Lawson & Jones Limited. Fast food serving tray. 4,512,512, Cl. 229-30.000.

Flood, Eugene J.: *See*—
Bondoc, Alfredo A.; Flood, Eugene J.; and Sieling, Frederick W., 4,513,045, Cl. 428-137.000.

Flying Dutchman, Inc.: *See*—
Lepley, James W., 4,512,703, Cl. 414-288.000.

Flynn, Peter J., to Bird Machine Company, Inc. Apparatus for removal by flotation of solid particles from liquid. 4,512,888, Cl. 210-221.200.

FMC Corporation: *See*—
Uppgren, John J., 4,512,385, Cl. 164-364.000.

Foam-Lag Industries Pty. Ltd.: *See*—
Willoughby, John C., 4,512,119, Cl. 52-58.000.

Foran, Charles D.; and Smith, Jack D., to Associated Dynamics, Incorporated. Method and apparatus for alignment of gearing. 4,512,694, Cl. 409-12.000.

Ford, Horace B. Energy efficient multi-phase dual voltage electric motor. 4,513,237, Cl. 318-768.000.

Ford Motor Company: *See*—
Bowman, Melvin B., 4,513,241, Cl. 323-285.000.
Holubka, Joseph W., 4,513,125, Cl. 525-528.000.
Mikola, James A., 4,513,356, Cl. 362-226.000.

Ford, Spencer K.: *See*—
Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., 4,512,163, Cl. 62-394.000.

Forester, Buford G. Geothermal expansion wellhead system. 4,512,410, Cl. 166-380.000.

Foster, Donald D. Down-locking dispensing pump with guided check valve hold-down structure. 4,512,501, Cl. 222-153.000.

Foster, Donald L.: *See*—
Kuo, Han C.; Foster, Donald L.; Schlaikjer, Carl R.; Gopikanth, Mysore L.; and Dey, Arabinda N., 4,513,067, Cl. 429-101.000.

Fostveit, Edgar H. Test apparatus for telephone equipment. 4,513,176, Cl. 179-175.10R.

Foust, Julian D.; Ysidro, Leonard M., Sr.; and Cross, Danny R., to Olin Corporation. Pallet height sensing mechanism. 4,512,701, Cl. 414-101.000.

Franz, Reinhard; Dittmar, Wilfried; and Daubach, Gunter, to Franz, Reinhard. Function selector. 4,513,365, Cl. 364-140.000.

Fraser, Alexander G., to AT&T Bell Laboratories. Transmission of status report of equipment in a digital transmission network. 4,513,411, Cl. 370-13.000.

Freeman, Earl R.: *See*—
Sweatman, Ronald E.; Freeman, Earl R.; Gottschling, John; and Simon, John, 4,512,405, Cl. 166-278.000.

Frei, Siegfried; and Koch, Jakob, to Cantec, Inc.; and Gebrueder Hoffmann AG, a part interest. Strengthened can bodies of thin-walled metal. 4,512,490, Cl. 220-72.000.

Frerking, Marvin E., to Rockwell International Corporation. Closed loop temperature compensated frequency reference. 4,513,259, Cl. 331-176.000.

Freudenthal, Frank D.; and Anderson, Carl M., to Altec Industries, Inc. Platform rotating mechanism for aerial devices. 4,512,436, Cl. 182-2.000.

Friedl, Richard, to LGZ Landis & Gyr Zug AG. Transducer for current measurement. 4,513,273, Cl. 336-55.000.

Friedline, Gary W.: *See*—
Caralli, Michael J.; and Friedline, Gary W., 4,512,781, Cl. 55-26.000.

Friedman, Aaron M. Popcorn popping and coating apparatus. 4,512,247, Cl. 99-323.500.

Friedman, Robert H., to Getty Oil Company. Sand consolidation methods using adsorbable catalysts. 4,512,407, Cl. 166-295.000.

Friedmann & Maier Aktiengesellschaft: *See*—
Brasseur, Georg; and Rathmayr, Heinz, 4,512,306, Cl. 123-367.000.

Fries, Richard W., to Northern Petrochemical Company. Process for conversion of vinyl copolymers to vinylic alcohol copolymers by homogeneous reaction with organometallic compounds. 4,513,117, Cl. 525-60.000.

Fronzoni, Mario A.: *See*—
Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., 4,512,821, Cl. 148-16.500.

Fuderer, Andrija, to Union Carbide Corporation. Pressure swing adsorption with intermediate product recovery. 4,512,780, Cl. 55-26.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Mochizuki, Kenji, 4,512,316, Cl. 123-478.000.
Yamakawa, Toru, 4,512,301, Cl. 123-198.00F.

Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo, 4,513,050, Cl. 428-200.000.
Furutachi, Nobuo; and Hirose, Takeshi, 4,513,082, Cl. 430-552.000.
Inukai, Yuzo, 4,512,518, Cl. 239-223.000.
Kitamoto, Tatsuji; and Akashi, Goro, 4,513,054, Cl. 428-329.000.
Ogawa, Akira; and Asano, Toshiaki, 4,512,807, Cl. 106-22.000.
Okazaki, Masaki; Tanabe, Osami; Nagaoka, Satoshi; Mihara, Yuji; Kimura, Keizo; and Umemoto, Makoto, 4,513,081, Cl. 430-550.000.
Sakanoue, Kei; and Aoki, Kozo, 4,513,079, Cl. 430-502.000.

Fuji Xerox Co., Ltd.: *See*—
Itoh, Satoru, 4,513,325, Cl. 358-280.000.
Svay, Leng; Moriguchi, Haruhiko; and Inui, Toshiharu, 4,513,296, Cl. 346-76.0PH.

Fujimura, Shuzo; and Yano, Hiroshi, to Fujitsu Limited. Microwave plasma processing apparatus. 4,512,868, Cl. 204-298.000.

Fujisaki, Hisashi: *See*—
Nishino, Masakazu; and Fujisaki, Hisashi, 4,513,177, Cl. 179-81.00B.

Fujisawa Pharmaceutical Co. Ltd.: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.

Fujitsu Fanuc Limited: *See*—
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,513,234, Cl. 318-594.000.

Fujitsu Limited: *See*—
Fujimura, Shuzo; and Yano, Hiroshi, 4,512,868, Cl. 204-298.000.
Masaki, Satoru, 4,513,400, Cl. 365-230.000.
Miwa, Hirohide; and Ueda, Mitsuhiro, 4,512,195, Cl. 73-602.000.
Miyamoto, Hidekazu; Shioya, Yoshimi; Maeda, Mamoru; and Takagi, Mikio, 4,513,026, Cl. 427-85.000.
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,513,075, Cl. 430-108.000.
Sano, Yoshiaki, 4,513,252, Cl. 330-257.000.
Takemae, Yoshihiro, 4,513,304, Cl. 357-23.600.

Fujitsu Ten Limited: *See*—
Yokoyama, Tatsuo, 4,513,245, Cl. 324-119.000.

Fujiwara, Ryuhei, to Nippon Electric Co., Ltd. System for adjusting a time axis by using a control and an adjustment time slot in a satellite station of a TDMA network. 4,513,416, Cl. 370-100.000.

Fukano, Michio, to Kabushiki Kaisha Tokyo Keiki. Accelerometer. 4,512,193, Cl. 73-517.00B.

Fukuhara, Masao, to Fukuhara Needle Company, Ltd. Pivoted latch needle. 4,512,164, Cl. 66-121.000.

Fukuhara Needle Company, Ltd.: *See*—
Fukuhara, Masao, 4,512,164, Cl. 66-121.000.

Fukuroi, Takeo, to Nippon Notion Kogyo Co., Ltd. Button. 4,512,063, Cl. 24-94.000.

Furutachi, Nobuo; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive materials. 4,513,082, Cl. 430-552.000.

Futamura, Osamu: *See*—
Oshima, Masao; Kato, Yutaka; Ogasawara, Mitsuhiko; and Futamura, Osamu, 4,512,936, Cl. 261-93.000.

Gabriel, Alfred P.: *See*—
Clark, James A.; and Gabriel, Alfred P., 4,512,206, Cl. 74-10.540.

GAF Corporation: *See*—
Bondoc, Alfredo A.; Flood, Eugene J.; and Sieling, Frederick W., 4,513,045, Cl. 428-137.000.
Lewis, David F., 4,513,076, Cl. 430-270.000.

Gahlinger, Earl C., to International Harvester Company. Bolster pin and method for cleaning flask bushing. 4,512,810, Cl. 134-8.000.

Galbraith, Lee K.; and Pecen, Jiri, to Tencor Instruments. Apparatus for calibrating a surface scanner. 4,512,659, Cl. 356-243.000.

Galbraith, Lyle D., to Rocket Research Company. Propellant augmented, pressurized gas dispensing device. 4,512,355, Cl. 137-68.00A.

Galuschak, George; and Stomber, Richard J., to Singer Company, The. Heading indicator. 4,512,086, Cl. 33-324.000.

Gamma Medical Products, Inc.: *See*—
Schneider, Barbara, 4,512,763, Cl. 604-5.000.

Gano, John C.; and Perkins, Donald H., to Otis Engineering Corporation. Well packer. 4,512,399, Cl. 166-120.000.

Ganoung, Jeffrey S.: *See*—
Keller, Frederick A., Jr.; Ganoung, Jeffrey S.; and Luenser, Susan J., 4,513,084, Cl. 435-140.000.

Ganzi, Gary C.; and Paul, Charles T., to Millipore Corporation. Method and structure for sealing tubular filter elments. 4,512,892, Cl. 210-493.200.

Gardiner, Richard J., to Hercules Incorporated. Method of making a curved composite beam. 4,512,835, Cl. 156-174.000.

Gardner, James A.: *See*—
Moore, John T.; Corrigan, Peter E.; and Gardner, James A., 4,513,277, Cl. 340-59.000.

Gardocki, Joseph F.: *See*—
Maryanoff, Bruce E.; and Gardocki, Joseph F., 4,513,006, Cl. 514-23.000.

Garrett, Michael J.: *See*—
Davis, Michael I.; Garrett, Michael J.; and Wiseman, John A., 4,513,351, Cl. 361-384.000.

Gast, Theodor; Kubach, Hans; and Binder, Kurt, to Robert Bosch GmbH. Magnetic valve. 4,512,549, Cl. 251-137.000.

Gauss, James C.: *See—*
Damrau, Wayne A.; and Gauss, James C., 4,512,279, Cl. 118-411.000.

Gebr. Happich GmbH: *See—*
Aschermann, Willi; and Haarhaus, Peter, 4,512,605, Cl. 296-97.00G.
Mahler, Gert; Falkenroth, Heinz-Jurgen; Leitermann, Wulf; and Boms, Manfred, 4,512,240, Cl. 98-2.040.

Gebrueder Hoffmann AG: *See—*
Frei, Siegfried; and Koch, Jakob, 4,512,490, Cl. 220-72.000.

Geisler, Richard W.: *See—*
Revici, Emanuel; Sherwood, Bob E.; Benecke, Herman P.; Rice, John M.; and Geisler, Richard W., 4,513,008, Cl. 514-560.000.

Gell, Maurice L.: *See—*
Duhl, David N.; Chen, Otis Y.; and Gell, Maurice L., 4,512,817, Cl. 148-3.000.

Genentech, Inc.: *See—*
Dennis, Mark S.; Estell, David A.; and Light, David R., 4,512,973, Cl. 424-94.000.
Jones, Andrew J. S.; Olson, Kenneth C.; and Shire, Steven J., 4,512,922, Cl. 260-112.00R.

General Electric Company: *See—*
Beers, Dale M., 4,513,115, Cl. 524-731.000.
Bennett, James G., Jr.; and Lee, Gim F., Jr., 4,513,120, Cl. 525-316.000.
Bloomer, Milton D., 4,513,207, Cl. 307-126.000.
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,512,946, Cl. 264-332.000.
Brunelle, Daniel J.; and Singleton, Daniel A., 4,513,141, Cl. 548-476.000.
Collins, Patrick C., 4,513,037, Cl. 428-35.000.
Devins, John C., 4,513,346, Cl. 361-212.000.
Erdman, David M., 4,513,230, Cl. 318-254.000.
Lemmers, Alfred E.; and Hammer, Edward E., 4,513,225, Cl. 315-189.000.
Leslie, Samuel A., 4,513,446, Cl. 455-73.000.
Liu, Ping Y., 4,513,119, Cl. 525-92.000.
Olson, Daniel; R.; and O'Donnell, Timothy W., 4,513,349, Cl. 361-311.000.
Peterson, Marvin A., 4,513,113, Cl. 524-602.000.
Rocha, Henry A. F., 4,513,342, Cl. 361-94.000.
Sandrik, John M.; and Pelc, Norbert J., 4,513,078, Cl. 430-496.000.
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,513,268, Cl. 335-35.000.
Spooner, Jerrold C., 4,513,380, Cl. 364-474.000.
Taub, Alan I., 4,512,824, Cl. 148-121.000.
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., 4,512,179, Cl. 73-4.00R.
Wilson, William P.; Hewlett, Catherine M.; and Rieben, Werner P., 4,513,379, Cl. 364-474.000.
Woodward, Stewart A.; Hilty, Ronald L.; and Stoll, Donald H., 4,512,199, Cl. 73-725.000.

General Foods Corporation: *See—*
Katz, Saul N.; and Proscia, George E., 4,513,136, Cl. 544-275.000.

General Motors Corporation: *See—*
Moore, John T.; Corrigan, Peter E.; and Gardner, James A., 4,513,277, Cl. 340-59.000.

General Resource Corporation: *See—*
Pettit, Douglas L.; and Piilola, Calvin E., 4,512,789, Cl. 55-378.000.

General Screw Products Company: *See—*
Cooper, Jack M., 4,512,441, Cl. 184-105.00B.

General Signal Corporation: *See—*
Jandrasi, Frank J.; Pampell, Davy G.; and Stinson, Walter J., 4,512,363, Cl. 137-375.000.
Right, Robert W., 4,513,284, Cl. 340-825.510.

Gennetten, Edward W.: *See—*
Gomez, Aldan D.; and Gennetten, Edward W., 4,513,329, Cl. 360-42.000.

Genth, Hermann: *See—*
Kuhle, Engelbert; Klauke, Erich; Paulus, Wilfried; and Genth, Hermann, 4,513,003, Cl. 514-411.000.

GEO Vann, Inc.: *See—*
Vann, Roy R.; George, Flint R.; and Warren, Dennis F., 4,512,406, Cl. 166-297.000.

Georg Knoblauch GmbH: *See—*
Knoblauch, Georg, 4,512,467, Cl. 206-379.000.

George, Flint R.: *See—*
Vann, Roy R.; George, Flint R.; and Warren, Dennis F., 4,512,406, Cl. 166-297.000.

Gerardi, John A.: *See—*
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., 4,513,367, Cl. 364-200.000.

Gerber Garment Technology, Inc.: *See—*
LeBlond, Claude W., 4,512,079, Cl. 33-1.00M.

Gerber, Heinz J., to Gerber Scientific, Inc. Multi-color sign making method and layup. 4,512,839, Cl. 156-248.000.

Gerber Scientific, Inc.: *See—*
Gerber, Heinz J., 4,512,839, Cl. 156-248.000.

Gerhards, Hans-Dieter: *See—*
Brauer, Hans; and Gerhards, Hans-Dieter, 4,512,173, Cl. 72-98.000.

Gerlach, Gunter: *See—*
Binnig, Rupert; Gerlach, Gunter; Nilles, Peter; and Pankatz, Jurgen, 4,512,811, Cl. 134-10.000.

Gershoni, Jonathan M., to Yale University. Transfer of macromolecules from a chromatographic substrate to an immobilizing matrix. 4,512,896, Cl. 210-635.000.

Gervasio, Vincenzo; and Dinelli, Dino, to Snamprogetti S.p.A. Exploitation of wind energy for producing electrical power. 4,513,206, Cl. 290-4.00C.

Getty Oil Company: *See—*
Erickson, Charles D., 4,512,188, Cl. 73-198.000.
Friedman, Robert H., 4,512,407, Cl. 166-295.000.
Sigwardt, Peter L., 4,512,187, Cl. 73-198.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Kerklies, Bodo, 4,512,459, Cl. 198-729.000.

GfE Gesellschaft fur Elektrometallurgie mbH: *See—*
Bauer, Gunter; and Eckert, Joachim, 4,512,958, Cl. 423-55.000.

Ghering, Walter L.; and Thompson, William L., to Babcock & Wilcox Company, The. Pulverized coal relative distribution meter. 4,512,200, Cl. 73-861.040.

Ghrist, William D., III, to Westinghouse Electric Corp. Steam turbine valve test system. 4,512,185, Cl. 73-118.000.

Giammarrusco, David P., to GTE Automatic Electric Incorporated. Pulse monitor circuit for use as a fan speed monitor. 4,513,233, Cl. 318-565.000.

Giannis, Peter M.: *See—*
Coy, Don R., Jr.; and Giannis, Peter M., 4,512,534, Cl. 242-198.000.

Gibson, Donald L. Indexing and locking assembly for multi-piece truck rims. 4,512,382, Cl. 152-408.000.

Giebeler, Robert H., Jr.: *See—*
Wedemeyer, Robert C.; and Giebeler, Robert H., Jr., 4,512,758, Cl. 494-13.000.

Giers, Alfred; and Heiland, Manfred, to Carl Schenck AG. Balancing machine bearing mounting for flexible rotors. 4,512,671, Cl. 384-215.000.

Gilbert, Clark J.; Hassialis, Menelaos D.; Scrymgeour, Andrew H.; and Vera, Samuel I., to Mobil Oil Corporation. Mining system. 4,512,610, Cl. 299-13.000.

Gill, Dennis, to Associated Electrical Industries Limited. Method of manufacturing mineral insulated electric cable and like elements. 4,512,827, Cl. 156-48.000.

Gill Industries, Inc.: *See—*
Hayatdavoudi, Asadollah; and Adams, Ladd M., 4,512,420, Cl. 175-67.000.

Gillery, F. Howard, to PPG Industries, Inc. Low resistance indium oxide films. 4,512,864, Cl. 204-192.00P.

Gillery, F. Howard: *See—*
Criss, Russell C.; and Gillery, F. Howard, 4,512,863, Cl. 204-192.00R.

Gioso, John. All purpose vehicle travel organizer. 4,512,503, Cl. 224-42.42R.

Girrell, Carol A.: *See—*
Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., 4,512,821, Cl. 148-16.500.

Gismondi, Thomas E.: *See—*
Ernst, Bruce H.; Howard, Dennis D.; and Gismondi, Thomas E., 4,513,112, Cl. 524-590.000.

Giuliani, John F.; and Wohltjen, Henry, to United States of America, Navy. Reversible optical waveguide vapor sensor. 4,513,087, Cl. 436-96.000.

Glaenzer Spicer: *See—*
Orain, Michel A., 4,512,750, Cl. 464-111.000.

Glass, Michael: *See—*
Carroll, Thomas J.; Corsello, Vincent G.; Glass, Michael; and Piccolo, Dominic J., 4,513,012, Cl. 426-5.000.

Glasstech, Inc.: *See—*
McMaster, Ronald A., 4,512,460, Cl. 198-790.000.

Glazer, Sydney, to NCR Corporation. Random binary bit signal generator. 4,513,386, Cl. 364-717.000.

Gleason Works, The: *See—*
Stritzel, Gene A., 4,512,211, Cl. 74-745.000.

Glenn, William K., III: *See—*
Laing, Gordon E.; Harbeck, Martin E.; Jones, John E.; Sumerau, William R.; and Glenn, William K., III, 4,512,057, Cl. 15-320.000.

Glenoit Mills, Inc.: *See—*
Lumb, Douglas S., 4,513,042, Cl. 428-95.000.

Glutz, Peter: *See—*
Ellett, Kenneth W.; and Glutz, Peter, 4,513,190, Cl. 219-56.210.

Go, Jok Y.: *See—*
Mehrotra, Deepak; Shaw, Gerard J.; Go, Jok Y.; and Kant, Rajni, 4,512,076, Cl. 29-578.000.

Goel, Anil B., to Ashland Oil, Inc. Naphthyl esters from tetralin. 4,512,927, Cl. 260-410.500.

Goetschius, Gary C., to Air Preheater Company, Inc., The. Heat transfer element assembly. 4,512,389, Cl. 165-10.000.

Gof Manufacturing Company, Inc.: *See—*
McGehee, R. Stephen, 4,512,285, Cl. 119-44.000.

Goldberg, Lawrence S., to United States of America, Navy. Picosecond broadband cars probe using the picosecond continuum. 4,512,660, Cl. 356-301.000.

Golden, James E.: *See—*
Suffi, Louis; Golden, James E.; and Jaycox, Donald F., 4,513,171, Cl. 174-41.000.

Goldhammer, Albert, to Feinwerktecnik Schleicher & Co., Firma. Baling press. 4,512,252, Cl. 100-53.000.

Goldman, Max, to Adsorbent Products Inc. Portable point source adsorber. 4,512,245, Cl. 98-115.400.

Gomez, Aldan D.; and Gennetten, Edward W., to United States of America, Navy. Manchester decoder clock multiplier. 4,513,329, Cl. 360-42.000.
Goodall, Steve R.; Dubowicz, Palemon W.; and Campbell, Donn V., to United States of America, Army. Whip antenna high voltage protection device. 4,513,338, Cl. 361-1.000.
Goodnight, Lyman E., Jr., to Milton Roy Company. Liquid chromatography tube connections. 4,512,899, Cl. 210-656.000.
Goodson, William H., III: *See*—
Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, 4,512,349, Cl. 128-632.000.
Gopikanth, Mysore L.: *See*—
Kuo, Han C.; Foster, Donald L.; Schlaikjer, Carl R.; Gopikanth, Mysore L.; and Dey, Arabinda N., 4,513,067, Cl. 429-101.000.
Gordon, Eric M.: *See*—
Weller, Harold N., III; Gordon, Eric M.; Karanewsky, Donald S.; and Ryono, Denis E., 4,512,988, Cl. 514-211.000.
Gordon, Paul, to Newport Pharmaceuticals International, Inc. Method of treating inflammation using inosiplex. 4,512,981, Cl. 514-45.000.
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., to Ardac, Inc. Security validator. 4,513,439, Cl. 382-7.000.
Gorman, Anthony G.; Smith, Peter L.; and Barrett, Paul Q., to Racal Acoustics Limited. Communication set and method. 4,513,413, Cl. 370-30.000.
Gosset, Serge: *See*—
Lumaret, Jean-Claude; Gosset, Serge; and Huchette, Michel, 4,512,915, Cl. 252-389.00A.
Gossett, Patricia W.: *See*—
Rizvi, Syed S. H.; and Gossett, Patricia W., 4,512,182, Cl. 73-64.100.
Gottrup, Finn: *See*—
Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, 4,512,349, Cl. 128-632.000.
Gottschling, John: *See*—
Sweatman, Ronald E.; Freeman, Earl R.; Gottschling, John; and Simon, John, 4,512,405, Cl. 166-278.000.
Gouilloud, Michel: *See*—
Sinha, Bikash K.; and Gouilloud, Michel, 4,512,198, Cl. 73-703.000.
Grabbe, Dimitry G.: *See*—
Bakermans, Johannes C. W.; Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,513,353, Cl. 361-399.000.
Grace, Robert E.: *See*—
Buck, Kenneth J.; Grace, Robert E.; and Hayes, Thomas A., Jr., 4,512,652, Cl. 355-14.0CH.
Gradel, Gerhard: *See*—
Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, 4,512,939, Cl. 264-0.500.
Grah, Klaus, to Beiersdorf AG. Method of electroplating printed circuits. 4,512,854, Cl. 204-15.000.
Graham, Johnny R. Apparatus for installing poultry feather picking fingers. 4,512,072, Cl. 29-252.000.
Graham, Joseph, to Minnesota Mining and Manufacturing Company. Flame resistant ashaltic compositions. 4,512,806, Cl. 106-18.240.
Graham, Marshall D.; and Cook, David D., Jr., to Coulter Electronics, Inc. Automated microscopy system and method for locating and re-locating objects in an image. 4,513,438, Cl. 382-6.000.
Grand, Marcel: *See*—
Bayssat, Michel; Belleville, Maryse; and Grand, Marcel, 4,512,994, Cl. 514-374.000.
Grantham, Daniel H., to United Technologies Corporation. Low parasitic capacitance pressure transducer and etch stop method. 4,513,348, Cl. 361-283.000.
Grasse Family Trust: *See*—
Grasse, Palmer, 4,512,611, Cl. 299-37.000.
Grasse, Palmer, to Grasse Family Trust, Palmer Grasse, Trustee. Oscillated head with bearing support and quick demountability. 4,512,611, Cl. 299-37.000.
Gray, George W.: *See*—
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,512,636, Cl. 350-350.00R.
Gray, Henry F.: *See*—
Greene, Richard F.; and Gray, Henry F., 4,513,308, Cl. 357-55.000.
Gray, Thomas J.; and Masse, Norman G., to Olin Corporation. Raney nickel alloy expanded mesh hydrogenation catalysts. 4,513,149, Cl. 564-449.000.
Graybeal, Walter C. Manhole closure with a single liquid impervious, two-way gas pressure relief valve. 4,512,492, Cl. 220-204.000.
Grays of Cambridge (Pakistan) Limited: *See*—
Coolen, Toon, 4,512,573, Cl. 273-67.00A.
Great Lakes Carbon Corporation: *See*—
Karagoz, Berch Y.; Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,513,425, Cl. 373-88.000.
Green, David T., to United States Surgical Corporation. Surgical clip applying apparatus, and clips and clip train for use therein. 4,512,345, Cl. 128-325.000.
Green, Jacqueline M.; and Numbers, Jody L., to Green, Jacqueline M. Nipple holder. 4,512,489, Cl. 220-19.000.
Green, Jerrold D.: *See*—
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.
Green, John L., to Combustion Engineering, Inc. Differential integral rotary knife control. 4,512,225, Cl. 83-38.000.
Green, Kenneth, to Green, Kenneth; and Thomas, Graham Edward. Rapid breathing, degassing and storage device for wine. 4,512,251, Cl. 99-472.000.
Greenawalt, Eddie L., to Dow Chemical Company, The. Form, fill and seal machine with hot gas and thermal impulse sealing. 4,512,138, Cl. 53-451.000.
Greene, Richard F.; and Gray, Henry F., to United States of America, Navy. p-n Junction controlled field emitter array cathode. 4,513,308, Cl. 357-55.000.
Greer, Terry N. Beverage dispensing apparatus. 4,512,377, Cl. 141-11.000.
Gregory, Edward W.; Danielson, Thomas R.; and Eberwine, Donald A., to Exxon Production Research Co. Moonpool guidance system for floating structures. 4,512,409, Cl. 166-352.000.
Greif Bros. Corporation: *See*—
Santoni, Cesar, 4,512,700, Cl. 413-4.000.
Greschner, Johann: *See*—
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., 4,513,203, Cl. 250-491.100.
Griner, Paul K.: *See*—
Schuller, James T.; Griner, Paul K.; and Mak, Nai H., 4,512,453, Cl. 194-1.00N.
Schuller, James T.; Smith, Barry L.; and Griner, Paul K., 4,512,454, Cl. 194-1.00D.
Groeschner, Donald L., to Perkin-Elmer Corporation, The. Pneumatic control valve manifold interface. 4,512,362, Cl. 137-356.000.
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, to L'Oreal. Composition in the form of a shampoo based on anthralin. 4,513,011, Cl. 514-730.000.
Gronholz, Donald D.: *See*—
Wright, Mervin E.; and Gronholz, Donald D., 4,512,891, Cl. 210-445.000.
Grunewald, Paul: *See*—
Seitz, Charles L.; Grunewald, Paul; Parker, Marshall M.; and Stafford, Irvin G., 4,513,278, Cl. 340-347.0DA.
Grusin, Gerald M., to Dart Industries Inc. Covered dish with adjustable opening. 4,512,497, Cl. 220-369.000.
GTE Automatic Electric Incorporated: *See*—
Giammarrusco, David P., 4,513,233, Cl. 318-565.000.
GTE Communications Products Corporation: *See*—
Kapral, Christopher W., 4,513,279, Cl. 340-347.0DA.
GTE Laboratories Incorporated: *See*—
Bloss, Walter L., III; and Brody, Edward M., 4,513,305, Cl. 357-30.000.
GTE Lenkurt Incorporated: *See*—
Kollanyi, Miklos J., 4,513,341, Cl. 361-91.000.
GTE Products Corporation: *See*—
Anderton, John J., 4,512,628, Cl. 350-96.200.
Labadini, William M.; and Scholz, John A., 4,513,227, Cl. 315-290.000.
Guillien, Michel: *See*—
Hing, Sam A.; and Guillien, Michel, 4,513,178, Cl. 179-81.00R.
Gulati, Surender K., to AT&T Bell Laboratories. Multiple self-contained logic gate counter circuit. 4,513,432, Cl. 377-121.000.
Gurney, Anthony R., to Donovan Wire & Iron. Parking brake lever assembly. 4,512,210, Cl. 74-535.000.
Gurney, John: *See*—
Drzewiecki, Tadeusz M.; Toda, Kenji; and Gurney, John, 4,512,371, Cl. 137-828.000.
Gutsch, James L. Horizontal plow system method and apparatus for reclaiming and homogenously blending bulk solid particulate matter such as coal. 4,512,705, Cl. 414-327.000.
Guttler, Hermann: *See*—
Hartmannsgruber, Max; Kriechbaum, Kurt; Schulz, Gunter; and Guttler, Hermann, 4,512,061, Cl. 19-239.000.
Haag, Gottlob: *See*—
Babitzka, Rudolf; Haag, Gottlob; and Linder, Ernst, 4,512,452, Cl. 192-104.00C.
Haag, Horst G.: *See*—
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., 4,512,926, Cl. 260-398.000.
Haarhaus, Peter: *See*—
Aschermann, Willi; and Haarhaus, Peter, 4,512,605, Cl. 296-97.00G.
Hackett, Charles M., Jr., to Rockwell International Corporation. Separation of communication signals in an adaptive antenna array. 4,513,383, Cl. 364-517.000.
Hafner, V. Walter: *See*—
Morris, Earl L.; and Hafner, V. Walter, 4,512,241, Cl. 98-32.000.
Hagemeister, Klaus, to Motoren-und Turbinen-Union Munchen GmbH. Method of manufacturing hollow flow profiles. 4,512,069, Cl. 29-156.80B.
Hagino, Tetsu: *See*—
Chuwman, Tsutomu; Hagino, Tetsu; and Tsuchida, Shozaburo, 4,512,446, Cl. 188-73.380.
Hahn, Erwin; and Neumann, Peter, to BASF Aktiengesellschaft. 1-Alkyl-2-isocyanatomethyl-isocyanatobenzenes and/or 1-alkyl-4-isocyanatomethyl-isocyanatobenzenes. 4,512,929, Cl. 260-453.0AR.
Hahn, Granville J.; and Rutledge, Raleigh N., to Cosden Technology, Inc. Multiple heat exchanger distribution apparatus. 4,512,395, Cl. 165-101.000.
Hahn, Granville J.; and Rutledge, Raleigh N., to Cosden Technology, Inc. Extrusion process for producing thermoplastic pipe. 4,512,943, Cl. 264-173.000.
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, to BASF Aktiengesellschaft. Particulate polystyrene

containing blowing agent and having improved expandability. 4,513,105, Cl. 521-56.000.

Hain, Paul O.; and Lepisto, J. George, to Champion International Corporation. Container with easy opening closure. 4,512,479, Cl. 206-632.000.

Hakuzen, Tatuzo: *See*—
Ohta, Hideo; Hakuzen, Tatuzo; Ito, Yasunori; and Takagi, Fusao, 4,512,829, Cl. 156-659.100.

Halder, Mathis, to LGZ Landis & Gyr Zug AG. Current transformer for measuring instruments. 4,513,274, Cl. 336-173.000.

Hale, David R.; Owen, William A.; and Orndorff, James A., Jr., to CBI Offshore, Inc. Mobile offshore structure for arctic exploratory drilling. 4,512,684, Cl. 405-217.000.

Hall, Nigel: *See*—
Anderton, Kenneth; Hall, Nigel; Parton, Brian; Renfrew, Andrew H. M.; and Shaw, Malcolm G., 4,512,773, Cl. 8-657.000.

Haller, Walter, to Swiss Aluminium Ltd. Adjustable mold for electromagnetic casting. 4,512,386, Cl. 164-467.000.

Halliburton Company: *See*—
Heemstra, Timothy R., 4,512,424, Cl. 175-299.000.
Regalbuto, John A.; Patton, James B.; and Sumner, Cyril R., 4,512,418, Cl. 175-4.560.

Hamada, Shigeki: *See*—
Sakurai, Shigeru; and Hamada, Shigeki, 4,512,786, Cl. 55-282.000.

Hamann, Georg. Sailboard rig. 4,512,276, Cl. 114-39.000.

Hamm, Wilfried. Multi-purpose sports-kit. 4,512,572, Cl. 272-144.000.

Hammann, Ingeborg: *See*—
Maurer, Fritz; Homeyer, Bernhard; and Hammann, Ingeborg, 4,513,000, Cl. 514-407.000.

Hammer, Edward E.: *See*—
Lemmers, Alfred E.; and Hammer, Edward E., 4,513,225, Cl. 315-189.000.

Hamprecht, Gerhard: *See*—
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,512,797, Cl. 71-93.000.

Hankin, Gary H.: *See*—
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., 4,512,179, Cl. 73-4.00R.

Hannan, Patrick J.; Stiffey, Arthur V.; Jarvis, N. Lynn; and Wohltjen, Henry, to United States of America, Navy. Method and apparatus for the detection of toxicants. 4,513,280, Cl. 340-632.000.

Hannecke, Wolf-Dietrich. Article display stand. 4,512,262, Cl. 108-61.000.

Hansen, Wayne W., to Sundstrand Corporation. Rotor cooling in rotary electric machines. 4,513,218, Cl. 310-270.000.

Hanson, Eric G.; Hiskes, Ronald; and Schantz, Christopher A., to Hewlett-Packard Company. Optical fiber with hermetic seal and method for making same. 4,512,629, Cl. 350-96.300.

Hanson, Jay L., to Thermo King Corporation. Diesel glow plug tip enlargement protection. 4,512,295, Cl. 123-145.00A.

Hanssle, Peter; and Zaar, Wolfgang, to Chemische Werke Huels, AG. Isomerization of isolated double bonds to conjugated double bonds in optionally substituted cyclooctadienes. 4,513,157, Cl. 585-378.000.

Hansson, P. E. Anders; and Jachimowicz, Felek, to W. R. Grace & Co. Retention and drainage aid. 4,513,122, Cl. 525-332.300.

Hansson, Per E. A.; and Jachimowicz, Felek, to W. R. Grace & Co. Wet strength material. 4,513,121, Cl. 525-332.300.

Harada, Takashi: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,512,893, Cl. 210-500.200.

Haraguchi, Hiroshi; and Narita, Ko, to Nippondenso Co., Ltd. Ignition timing control system for internal combustion engines. 4,512,310, Cl. 123-425.000.

Harbeck, Martin E.: *See*—
Laing, Gordon E.; Harbeck, Martin E.; Jones, John E.; Sumerau, William R.; and Glenn, William K., III, 4,512,057, Cl. 15-320.000.

Harden, Theodore A., to Takasago USA, Inc. Apparatus for dispensing volatile substances. 4,512,933, Cl. 261-30.000.

Harding, LeRoy A., to Plastofilm Industries, Inc. Locking means for display package. 4,512,474, Cl. 206-461.000.

Harman, Stephen G., to Northern Telecom Limited. Signal cuber. 4,513,250, Cl. 328-163.000.

Harr, Jerome D., to International Business Machines Corporation. Integrated circuit filter with adjustable characteristics. 4,513,254, Cl. 330-294.000.

Harra, David J., to Varian Associates, Inc. Apparatus for thermal treatment of semiconductor wafers by gas conduction incorporating peripheral gas inlet. 4,512,391, Cl. 165-48.00R.

Harris Corporation: *See*—
Delman, Dennis J., 4,513,440, Cl. 382-30.000.

Harris Graphics Corporation: *See*—
Schriber, Louis; Stephens, Robert E.; and Blaha, John F., 4,512,256, Cl. 101-248.000.

Harris, William T.: *See*—
Mohon, Windell N.; and Harris, William T., 4,512,745, Cl. 434-43.000.

Harrison, Cecil P., to Tennessee Valley Authority. Granulation of urea phosphate from urea and merchant-grade phosphoric acid. 4,512,793, Cl. 71-29.000.

Harshaw/Filtrol: *See*—
Scherzer, Julius; and Humphries, Adrian P., 4,512,961, Cl. 423-328.000.

Hartmann, Michel, to Societe d'Etudes et de Constructions Electriques et Mecaniques Secem. High-temperature kilns. 4,512,738, Cl. 432-247.000.

Hartmannsgruber, Max; Kriechbaum, Kurt; Schulz, Gunter; and Guttler, Hermann, to Zinser Textilmaschinen GmbH. Method of controlling fiber-drawing apparatus. 4,512,061, Cl. 19-239.000.

Harvey, Bruce J.: *See*—
Pauwels, Michael A.; Wright, Danny O.; Harvey, Bruce J.; and Bauer, Thomas J., 4,512,317, Cl. 123-478.000.

Hasebe, Koshi; Miura, Kunio; Ono, Takashi; Akutsu, Kazushi; and Minami, Kazuaki, to Nippondenso Co., Ltd. Vehicle-mounted navigator. 4,513,377, Cl. 364-449.000.

Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, to Takeda Chemical Industries, Ltd. Macbecin derivatives and their production. 4,512,975, Cl. 424-121.000.

Hasegawa, Yoshimichi: *See*—
Aoyama, Shigetsune; Yoshikawa, Kazuo; Hasegawa, Yoshimichi; and Higuchi, Junichi, 4,512,559, Cl. 267-47.000.

Hashi, Saeko: *See*—
Hashi, Takahiro; and Hashi, Saeko, 4,513,063, Cl. 428-377.000.

Hashi, Takahiro; and Hashi, Saeko. Coated rubber cord. 4,513,063, Cl. 428-377.000.

Hashimota, Yasumasa: *See*—
Ishigami, Yoshihisa; Hashimota, Yasumasa; Kitado, Tadaharu; Nishimura, Hiromi; and Mori, Tetsuo, 4,513,339, Cl. 361-45.000.

Hashimoto, Eiji: *See*—
Igashira, Toshihiko; Kawai, Hisasi; Tanaka, Takeshi; Iwamoto, Kenzi; Abe, Seiko; and Hashimoto, Eiji, 4,512,307, Cl. 123-383.000.

Hashimoto, Kenji: *See*—
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Hashimoto, Masashi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.

Hashimoto, Mayuki: *See*—
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,512,557, Cl. 266-171.000.

Hashimoto, Takao: *See*—
Sakurada, Satoshi; Hashimoto, Takao; Tagaya, Nobuaki; Maeshima, Tsugio; Ueda, Kayako; and Kokubo, Masahiro, 4,513,166, Cl. 585-832.000.

Haslanger, Martin F.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,513,103, Cl. 514-469.000.

Hassall, Cedric H.: *See*—
Attwood, Michael R.; Hassall, Cedric H.; Lambert, Robert W.; Lawton, Geoffrey; and Redshaw, Sally, 4,512,924, Cl. 260-243.300.

Hassialis, Menelaos D.: *See*—
Gilbert, Clark J.; Hassialis, Menelaos D.; Scrymgeour, Andrew H.; and Vera, Samuel I., 4,512,610, Cl. 299-13.000.

Hattori, Shigeo: *See*—
Mori, Yasuhiko; Hattori, Shigeo; Masaoka, Isao; and Itow, Hisao, 4,512,820, Cl. 148-12.70N.

Hattori, Torao, to Hontla Giken Kogyo Kabushiki Kaisha. V-belt transmission apparatus. 4,512,753, Cl. 474-242.000.

Haury, Andre : *See*—
Belbel, Elie; Blanchard, Christian; Lauraire, Michel; Fechant, Louis; and Haury, Andre , 4,513,270, Cl. 335-195.000.

Hauske, James R.; and Nagel, Arthur A., to Pfizer Inc. 9α-Aza-9α-homoerythromycin compounds, pharmaceutical composition and therapeutic method. 4,512,982, Cl. 514-29.000.

Hawkins, Ronald G.: *See*—
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.

Hay, Leon, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method and installation for separating a composite gas by adsorption. 4,512,779, Cl. 55-26.000.

Hay, Leon: *See*—
Simonet, Guy; and Hay, Leon, 4,512,778, Cl. 55-26.000.

Hayakawa, Masanori; and Nishimura, Satoshi, to Central Glass Company Limited. Wet process for preparing ferrites of magnetoplumbite structure in fine particle form. 4,512,906, Cl. 252-62.630.

Hayashi, Chihiro; and Nakasuji, Kazuyuki, to Sumitomo Metal Industries, Ltd. Method of manufacturing metallic materials having a circular cross section. 4,512,177, Cl. 72-368.000.

Hayashi, Isao, to Nissan Motor Company, Limited. Engine lubricating system. 4,512,298, Cl. 123-196.00R.

Hayatdavoudi, Asadollah; and Adams, Ladd M., to Gill Industries, Inc. Downhole vortex generator. 4,512,420, Cl. 175-67.000.

Hayes, Thomas A., Jr.: *See*—
Buck, Kenneth J.; Grace, Robert E.; and Hayes, Thomas A., Jr., 4,512,652, Cl. 355-14.0CH.

Hayhurst, Gordon A.; and Rayner, David A., to J.H. Fenner & Co. Limited. Taper bush. 4,512,681, Cl. 403-371.000.

Hays, Charles: *See*—
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Hazel, James A., to Standard Oil Company. Pump-out plug catcher. 4,512,398, Cl. 166-70.000.

Hazeltine Corporation: *See*—
St. John, Karl M.; Reeber, Nicholas J.; and Kerbel, Sheldon J., 4,513,314, Cl. 358-76.000.

Hecker, Leonard R., to McNeilab, Inc. 2-Amino-4,5-dihydro-1H-imizole-1-carboxanilides. 4,513,140, Cl. 548-315.000.

Heckler & Koch GmbH: *See*—
Thevis, Paul; and Danner, Helmut, 4,512,236, Cl. 89-128.000.

Hedlund, Martin L.: *See*—
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,512,798, Cl. 75-3.000.
Heemstra, Timothy R., to Halliburton Company. Tubular spring slip-joint and jar. 4,512,424, Cl. 175-299.000.
Heggeland, Bruce: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,512,361, Cl. 137-355.270.
Hegle, Richard L., to Ameron, Inc. Mortarless retaining-wall system and components thereof. 4,512,685, Cl. 405-284.000.
Heidecker, Robert F., to Dairy Systems, Inc. Animal identification band and method and means for permanently fastening same. 4,512,096, Cl. 40-304.000.
Heil, Ernst: *See*—
Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, 4,513,118, Cl. 525-81.000.
Heiland, Manfred: *See*—
Giers, Alfred; and Heiland, Manfred, 4,512,671, Cl. 384-215.000.
Heile, Bernard J., to Economics Laboratory, Inc. Highly alkaline liquid warewashing emulsion stabilized by clay thickener. 4,512,908, Cl. 252-160.000.
Heineken Technisch Beheer, B.V.: *See*—
Aalbers, Vas J., 4,513,013, Cl. 426-16.000.
Heitmann, Jurgen, to Robert Bosch GmbH. Method of recording video signals within a predetermined bit/unit time recording rate. 4,513,328, Cl. 360-8.000.
Heller, Jorge: *See*—
Ng, Steven Y.; Penhale, Donald W.; and Heller, Jorge, 4,513,143, Cl. 549-335.000.
Helling, Gunter, to Agfa-Gevaert AG. Photographic silver halide containing recording material with crosslinked microgel particles. 4,513,080, Cl. 430-537.000.
Helm, Emanuel. Cable holding and positioning apparatus and splicing method. 4,512,828, Cl. 156-49.000.
Hemmi, Keiji: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.
Henkel Kommanditgesellschaft: *See*—
Pesch, Wolfgang; and Beer, Gunter, 4,512,808, Cl. 106-83.000.
Hennekes, Daniel M.; Kolde, Richard A.; and Suica, David E., to Cincinnati Milacron Inc. Robot toolchanger system. 4,512,709, Cl. 414-729.000.
Hennig, Franz, to Jagenberg AG. Spout for liquid packing apparatus. 4,512,379, Cl. 141-286.000.
Henry, Jill. Recreational towel. 4,512,049, Cl. 5-417.000.
Henry, Michael D.; Ableidinger, Bruce J.; and Agarwal, Nirmal K., to Northwest Instrument Systems, Inc. Apparatus and method for acquiring multiple groups of data signals from a synchronous logic system. 4,513,395, Cl. 364-900.000.
Henshaw, Philip D., to Sparta, Inc. Image comparison system. 4,513,441, Cl. 382-43.000.
Hercules Incorporated: *See*—
Gardiner, Richard J., 4,512,835, Cl. 156-174.000.
Herdeg, Donald F.; and Matseas, William G., to USM Corporation. Pattern selection system. 4,512,271, Cl. 112-158.00E.
Herman Miller, Inc.: *See*—
Wilcox, Jeffrey S.; and Nienhuis, James H., 4,513,347, Cl. 361-212.000.
Herman, Morton B., to Standard Microsystems Corporation. Software security method using partial fabrication of proprietary control word decoders and microinstruction memories. 4,513,174, Cl. 178-22.080.
Hermann C. Starck Berlin: *See*—
Albrecht, Wolf-Wigand; Papp, Uwe; and Behrens, Dieter, 4,512,805, Cl. 75-244.000.
Hermelin, Victor M. Force opposition type exerciser. 4,512,571, Cl. 272-126.000.
Herrington, Allen G.; and Herrington, Nicholas L. Distributor moisture guard. 4,512,296, Cl. 123-146.50R.
Herrington, F. John, Jr., to Mobil Oil Corporation. Plastic bag dispenser. 4,512,476, Cl. 206-554.000.
Herrington, Nicholas L.: *See*—
Herrington, Allen G.; and Herrington, Nicholas L., 4,512,296, Cl. 123-146.50R.
Herrmann, Gerhard: *See*—
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, 4,512,670, Cl. 384-147.000.
Olschewski, Armin; Herrmann, Gerhard; Bauer, Bernhard; and Zirk, Elisabeth, 4,512,672, Cl. 384-477.000.
Hesston Corporation: *See*—
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Hettinger, William P., Jr.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.
Hewlett, Catherine M.: *See*—
Wilson, William P.; Hewlett, Catherine M.; and Rieben, Werner P., 4,513,379, Cl. 364-474.000.
Hewlett-Packard Company: *See*—
Hanson, Eric G.; Hiskes, Ronald; and Schantz, Christopher A., 4,512,629, Cl. 350-96.300.
Scheu, Friedrich, 4,513,298, Cl. 346-140.00R.
Hicks, Douglas C.; and Pleass, Charles M., to University of Delaware. Wave-powered desalination of water. 4,512,886, Cl. 210-170.000.
Higashimoto Kikai Co., Ltd.: *See*—
Higashimoto, Tsuyoshi, 4,512,523, Cl. 241-82.400.
Higashimoto, Tsuyoshi, to Higashimoto Kikai Co., Ltd. Apparatus for mincing frozen meat into ground meat. 4,512,523, Cl. 241-82.400.
Higgins, David T.: *See*—
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Higuchi, Junichi: *See*—
Aoyama, Shigetsune; Yoshikawa, Kazuo; Hasegawa, Yoshimichi; and Higuchi, Junichi, 4,512,559, Cl. 267-47.000.
Higuchi, Kazuaki: *See*—
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Hill, Clinton W., to U.S. Plastics Corporation. Gravity switch. 4,513,183, Cl. 200-61.45R.
Hill, Graham A.: *See*—
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Hills, Joseph F., to Jimmy's Radio & Television Corp. Automotive sound system. 4,513,405, Cl. 369-12.000.
Hilmersson, Anders; Lagerstedt, Jan; and Andersson, Helge, to Tetra Pak International AB. Apparatus for the volatilization of a liquid. 4,512,935, Cl. 261-79.00A.
Hilty, Ronald L.: *See*—
Woodward, Stewart A.; Hilty, Ronald L.; and Stoll, Donald H., 4,512,199, Cl. 73-725.000.
Hing, Sam A.; and Guillien, Michel, to Motorola, Inc. Signal processing arrangement. 4,513,178, Cl. 179-81.00R.
Hinojosa, Alberto L.; Kim, Kee; and Chickering, Kenton, III, to Daniel Industries, Inc. Valve mechanism with replaceable seal rings. 4,512,359, Cl. 137-315.000.
Hirai, Jun; and Kaneko, Masayasu, to Sony Corporation. Video signal processing unit. 4,513,311, Cl. 358-40.000.
Hirakoso, Yohei: *See*—
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Hiramatsu, Akira: *See*—
Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, 4,513,219, Cl. 310-328.000.
Hirano, Hiroyuki: *See*—
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Hirata, Mitsuki; Sato, Yoshitaka; and Matudaira, Kaname, to Kubota Ltd. Rotary cultivating apparatus of laterally shiftable type. 4,512,413, Cl. 172-74.000.
Hirose, Takeshi: *See*—
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Hirose, Toshifumi: *See*—
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,513,061, Cl. 428-429.000.
Hiskes, Ronald: *See*—
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Hitachi Chemical Company, Ltd.: *See*—
Isobe, Asao; Makino, Daisuke; and Shiraishi, Hiroshi, 4,513,077, Cl. 430-270.000.
Hitachi Koki Co., Ltd.: *See*—
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.
Hitachi, Ltd.: *See*—
Isobe, Asao; Makino, Daisuke; and Shiraishi, Hiroshi, 4,513,077, Cl. 430-270.000.
Mori, Yasuhiko; Hattori, Shigeo; Masaoka, Isao; and Itow, Hisao, 4,512,820, Cl. 148-12.70N.
Morita, Yasukazu; and Watanabe, Naomitsu, 4,513,024, Cl. 427-65.000.
Shoji, Fusaji; Takemoto, Issei; Kataoka, Fumio; Yokono, Hitoshi; and Isogai, Tokio, 4,513,132, Cl. 528-21.000.
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.
Hitchens, Max W.; and Rote, George B. Material conveying system simulation and monitoring apparatus. 4,512,747, Cl. 434-428.000.
Hochradel, Hans. Pneumatic tube system with carrier. 4,512,688, Cl. 406-111.000.
Hodes, David S.; Leidy, Grace; Sprunt, Katherine; and Weldy, Piper. Preparation of an antibiotic selectively effective against staphylococcus infections. 4,513,083, Cl. 435-68.000.
Hoechst Aktiengesellschaft: *See*—
Winkelmann, Detlef, 4,512,658, Cl. 355-14.0SH.
Hofer, Gerald; Straubel, Max; and Eheim, Franz, to Robert Bosch GmbH. Device for adjusting the full-load injection quantity of a fuel injection pump for internal combustion engines. 4,512,308, Cl. 123-383.000.
Hoffman, Dwight K., to Dow Chemical Company, The. Preparation of a copolymer polyahl using an addition polymerizable adduct of a polymeric monoahl and an ethylenically unsaturated coreactant. 4,513,124, Cl. 525-452.000.
Hoffmann-La Roche Inc.: *See*—
Adam-Molina, Solange; and Hofheinz, Werner, 4,512,999, Cl. 514-192.000.
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,513,002, Cl. 514-408.000.
Attwood, Michael R.; Hassall, Cedric H.; Lambert, Robert W.; Lawton, Geoffrey; and Redshaw, Sally, 4,512,924, Cl. 260-243.300.

Hoffmann, Paul D., to Lilie-Hoffman Cooling Towers, Inc. Grid and fill slats for cooling towers. 4,512,937, Cl. 261-111.000.

Hofheinz, Werner: *See—*
Adam-Molina, Solange; and Hofheinz, Werner, 4,512,999, Cl. 514-192.000.

Hogg, Christine: *See—*
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,512,636, Cl. 350-350.00R.

Hokko Chemical Industry Co., Ltd.: *See—*
Ohyama, Hiroshi; Morita, Ken; Wada, Takuo; and Miyahara, Masahiko, 4,512,989, Cl. 514-383.000.

Holey, Timothy M.: *See—*
Ackermann, Albert B.; Jones, Donald K.; and Holey, Timothy M., 4,512,539, Cl. 244-137.00P.

Holighaus, Rolf: *See—*
Escher, Gert; Holighaus, Rolf; and Wenning, Hans-Peter, 4,512,873, Cl. 208-13.000.

Holland, Jack O. Pitch adjuster. 4,512,233, Cl. 84-394.000.

Holliday, Edward M.: *See—*
Weathers, Glenn D.; and Holliday, Edward M., 4,513,288, Cl. 343-17.2PC.

Hollins, Brian E.: *See—*
Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., 4,512,815, Cl. 148-1.500.

Holmen Chemicals Limited: *See—*
Payne, John D., 4,512,180, Cl. 73-7.000.

Holubka, Joseph W., to Ford Motor Company. Crosslinkable composition of matter - II. 4,513,125, Cl. 525-528.000.

Homac Mfg. Company: *See—*
McGrane, Eugene W., 4,513,169, Cl. 174-138.00F.

Home Care Industries, Inc.: *See—*
Weinstein, Raymond P., 4,512,788, Cl. 55-374.000.

Homeyer, Bernhard: *See—*
Maurer, Fritz; Homeyer, Bernhard; and Hammann, Ingeborg, 4,513,000, Cl. 514-407.000.

Homma, Yoshifumi: *See—*
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hattori, Torao, 4,512,753, Cl. 474-242.000.
Yamato, Akihiro, 4,512,321, Cl. 123-493.000.
Yoshioka, Toshiharu, 4,512,392, Cl. 280-279.000.

Honda, Kiyokazu: *See—*
Nieda, Yasuhiro; and Honda, Kiyokazu, 4,513,357, Cl. 362-228.000.

Honeycutt, Thomas E.: *See—*
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,512,639, Cl. 350-418.000.

Honeywell Information Systems Inc.: *See—*
Shenk, William H., 4,513,392, Cl. 364-900.000.

Hooks, John T., Jr., to LTV Aerospace and Defense. Memory system. 4,513,374, Cl. 364-200.000.

Horak, Charles F.; and Jordan, James M. Hand-held shoe polishing apparatus. 4,512,053, Cl. 15-28.000.

Horan, Grant S.: *See—*
Manning, Edward T., Jr.; and Horan, Grant S., 4,512,260, Cl. 104-252.000.

Horansky, Frank J.: *See—*
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.

Horger, Oscar J., to A. Stucki Company. Self-steering railway truck. 4,512,261, Cl. 105-167.000.

Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, to Alps Electric Co., Ltd. Serial printer. 4,512,675, Cl. 400-328.000.

Horstmann, Harald: *See—*
Boltze, Karl-Heinz; and Horstmann, Harald, 4,513,004, Cl. 514-414.000.

Horvath, Tibor, to Metaframe, Inc. Electric pump for use in filtering system of a tropical fish tank or the like. 4,512,724, Cl. 417-319.000.

Hosaka, Miyako: *See—*
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,513,061, Cl. 428-429.000.

Hosel, Peter, to Agfa-Gevaert AG. Arrangement for unloading and loading X-ray film cassettes. 4,512,704, Cl. 414-292.000.

Hosoda, Naoyuki; Uchiyama, Naoki; and Kawanaka, Ryusuke, to Mitsubishi Kinzoku Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Lead alloy soft solder containing radioactive particles used to make more reliable semiconductor devices. 4,512,950, Cl. 420-563.000.

Hosoi, Masatoshi: *See—*
Kamiya, Kenji; and Hosoi, Masatoshi, 4,512,229, Cl. 84-1.010.

Hosonuma, Kunihiko: *See—*
Tamura, Kunimitsu; and Hosonuma, Kunihiko, 4,513,155, Cl. 585-13.000.

Hou, Kenneth C.: *See—*
Crowder, Alvin L., III; Dailey, Nils L.; Fiore, Joseph V.; and Hou, Kenneth C., 4,512,897, Cl. 210-656.000.

Houseman, David L., to Data General Corporation. Digital data processing system having object-based logical memory addressing and self-structuring modular memory. 4,513,368, Cl. 364-200.000.

Houser, John, Jr.; and Laughon, Thomas C., to Singer Company, The. Speed regulator for power tool. 4,513,381, Cl. 364-475.000.

Howard, Dennis D.: *See—*
Ernst, Bruce H.; Howard, Dennis D.; and Gismondi, Thomas E., 4,513,112, Cl. 524-590.000.

Howe, Michael W.; and Sopp, Samuel W., to Calgon Corporation. Barium or chromium additives to magnesium oxide coating slurry. 4,512,823, Cl. 148-113.000.

Howell, Donald J., to Sponco Mfg., Inc. Control mechanism for aerial ladders. 4,512,439, Cl. 182-66.000.

Hsu, Sheng T., to RCA Corporation. Method of forming self-aligned contact openings. 4,512,073, Cl. 29-571.000.

Hsu, Yu-Wen, to Kaiser Aluminum & Chemical Corporation. Process and apparatus for strip flatness and tension measurements. 4,512,170, Cl. 72-17.000.

Huchette, Michel: *See—*
Lumaret, Jean-Claude; Gosset, Serge; and Huchette, Michel, 4,512,915, Cl. 252-389.00A.

Huggins, Raymond W., to Xerox Corporation. Acoustic reflectometer for sheet feed sensing. 4,513,404, Cl. 367-93.000.

Hughes Aircraft Company: *See—*
Peters, John W., 4,513,057, Cl. 428-336.000.
Rensink, Loman, 4,513,361, Cl. 363-21.000.
Terbrack, William H., 4,513,255, Cl. 331-1.00A.

Hughes, Richard E. Flow actuated switch. 4,513,184, Cl. 200-81.90M.

Hughes Tool Company: *See—*
Del Serra, David I., 4,513,215, Cl. 310-90.000.
Sweatman, Ronald E.; Freeman, Earl R.; Gottschling, John; and Simon, John, 4,512,405, Cl. 166-278.000.

Huhne, Volker: *See—*
Raue, Roderich; Huhne, Volker; and Kuhlthau, Hans-Peter, 4,513,142, Cl. 548-507.000.

Hulett, John G.; and Rothenberger, Robert. Electrical heating cap. 4,512,830, Cl. 156-70.000.

Humphries, Adrian P.: *See—*
Scherzer, Julius; and Humphries, Adrian P., 4,512,961, Cl. 423-328.000.

Hundertmark, James M., to Brunswick Corporation. Accessory gear drive for a two-cycle engine. 4,512,292, Cl. 123-65.00B.

Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, to University of California, Regents of the. Method of direct tissue gas tension measurement and apparatus therefor. 4,512,349, Cl. 128-632.000.

Huon de Kermadec, Jean, to Soule Fer et Froid S.A. Automatic transport system comprising cable-drawn non-motorized vehicles. 4,512,259, Cl. 104-208.000.

Husqvarna Aktiebolag: *See—*
Skogward, Kenneth O. E., 4,512,273, Cl. 112-315.000.

Husslein, Gerd: *See—*
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,512,984, Cl. 514-147.000.

Hutchings, Ron; Loitzl, Ruzica; and Muller, Klaus, to BBC Brown, Boveri & Company, Limited. Catalyst for coating anodes and a process for its preparation. 4,513,102, Cl. 502-325.000.

Hydro-Quebec: *See—*
Racine, Jacques, 4,512,554, Cl. 254-131.000.

Iannadrea, Gerald M.: *See—*
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,513,439, Cl. 382-7.000.

Ichikawa, Sadao; and Kamiya, Tuyoshi, to NGK Spark Plug Co., Ltd.; and Nissan Motor Company, Limited. Apparatus for controlling energization of glow plugs. 4,512,297, Cl. 123-179.00H.

Igashira, Toshihiko; Kawai, Hisasi; Tanaka, Takeshi; Iwamoto, Kenzi; Abe, Seiko; and Hashimoto, Eiji, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Fuel quantity control apparatus of supercharged diesel engine with safety measures. 4,512,307, Cl. 123-383.000.

Ihara, Kiyohiko: *See—*
Nakagawa, Shinichi; Ihara, Kiyohiko; and Sogabe, Toshio, 4,513,129, Cl. 526-249.000.

Ihde, Richard C.: *See—*
Thompson, Kenneth P.; and Ihde, Richard C., 4,513,036, Cl. 428-35.000.

Ikegami Tsushinki Co., Ltd.: *See—*
Kobayashi, Yuji; and Okada, Takao, 4,513,316, Cl. 358-106.000.

Ikenoue, Tsuneo; Liu, Shin-yng; Arai, Naoki; and Umemoto, Shuichi, to Ikenoue, Tsuneo; Tohoku Ricoh Co., Ltd.; Stanley Electric Co., Ltd.; and Micron Kiki Co. Ltd. DC-DC converter having energy storage inductance element connected in flywheel circuit. 4,513,360, Cl. 363-20.000.

Imperial Chemical Industries PLC: *See—*
Anderton, Kenneth; Hall, Nigel; Parton, Brian; Renfrew, Andrew H. M.; and Shaw, Malcolm G., 4,512,773, Cl. 8-657.000.
Doroszkowski, Andrew, 4,512,861, Cl. 204-181.00R.
Robson, Michael J., 4,512,931, Cl. 260-465.00D.

Inada, Masami; and Hashimoto, Kenji, to Aisin Seiki Kabushiki Kaisha. Solenoid actuated valve device. 4,512,546, Cl. 251-65.000.

Inagaki, Mitsuo: *See—*
Nakano, Hiromichi; Sasaya, Hideaki; Inagaki, Mitsuo; Matsui, Kazuma; and Yoshimura, Kunimasa, 4,512,728, Cl. 418-3.000.

Industrial Automation Corp.: *See—*
Peyton, John J., 4,512,456, Cl. 198-479.000.

Industrias Penoles S.A. de C.V.: *See—*
Nielsen, Hans C. A.; and Schroeder, Roberto, 4,512,809, Cl. 106-103.000.

Ingersoll-Rand Company: *See—*
Kurt, Ewald H., 4,512,417, Cl. 173-77.000.

Inland Steel Company: *See*—
Patil, Ram S.; Johnson, Donald F.; and Quasney, John T., 4,513,033, Cl. 427-349.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,512,859, Cl. 204-129.460.
Inoue, Kiyoshi, 4,513,191, Cl. 219-69.00M.
Inoue, Kiyoshi, 4,513,192, Cl. 219-69.00W.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Abrasive polishing method. 4,512,859, Cl. 204-129.460.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for resetting a wire electrode in an operating setup on an electroerosion machine. 4,513,191, Cl. 219-69.00M.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. TW-EDM Method and apparatus with excess fluid stripping gas jet nozzle. 4,513,192, Cl. 219-69.00W.

Institut de Recherche en Sante et en Securite du Travail du Quebec: *See*—
Savage, Garry, 4,512,437, Cl. 182-3.000.

Institute of Gas Technology: *See*—
Claar, Terry D.; and Petri, Randy J., 4,512,388, Cl. 165-1.000.

Interlock Structures International, Inc.: *See*—
Lange, Fredric A., 4,512,117, Cl. 52-6.000.

International Business Machines Corporation: *See*—
Abbas, Shakir A.; and Magdo, Ingrid E., 4,513,303, Cl. 357-23.300.
Bardell, Paul H., Jr.; and McAnney, William H., 4,513,418, Cl. 371-25.000.
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., 4,513,203, Cl. 250-491.100.
Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, 4,512,847, Cl. 156-626.000.
Chainer, Timothy J.; Scranton, Robert A.; and Worthington, Thomas K., 4,513,437, Cl. 382-3.000.
Chamberlain, Savvas G.; and Schlig, Eugene S., 4,513,431, Cl. 377-60.000.
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., 4,513,367, Cl. 364-200.000.
Cunningham, George F., Jr.; Lewis, John W.; McClure, Robert B.; and Poindexter, Daniel J., 4,512,841, Cl. 156-345.000.
Davis, Michael I.; Garrett, Michael J.; and Wiseman, John A., 4,513,351, Cl. 361-384.000.
Edlund, Olof A.; Enser, Mats A.; Strage, Jan W.; Thunberg, Svante B.; and Wallmark, Erik I., 4,513,393, Cl. 364-900.000.
Harr, Jerome D., 4,513,254, Cl. 330-294.000.
Lanning, Frederick E., 4,512,263, Cl. 109-66.000.
Lee, Francis C.; Mills, Ross N.; Payne, Robert N.; and Talke, Frank E., 4,513,299, Cl. 346-140.00R.
Leininger, Joel C., 4,513,283, Cl. 340-825.020.
Macur, George J.; Pratt, W. Robert; and Sharkness, James E., 4,512,900, Cl. 210-748.000.
Maddock, Robert F., 4,513,391, Cl. 364-900.000.
Rigby, Eugene B., 4,512,862, Cl. 204-192.00D.

International Flavors & Fragrances Inc.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,512,902, Cl. 252-8.600.
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,512,918, Cl. 252-522.00R.
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,512,919, Cl. 252-522.00R.

International Harvester Company: *See*—
Egan, John J.; and Witkowski, Andrew B., 4,512,299, Cl. 123-196.00A.
Gahlinger, Earl C., 4,512,810, Cl. 134-8.000.

International Paper Company: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,512,849, Cl. 162-157.200.

International Telephone and Telegraph Corporation: *See*—
Knapke, Paul H.; and Miller, Robert L., 4,513,414, Cl. 370-58.000.

Inui, Toshiharu: *See*—
Svay, Leng; Moriguchi, Haruhiko; and Inui, Toshiharu, 4,513,296, Cl. 346-76.0PH.

Inukai, Yuzo, to Fuji Photo Film Co., Ltd. Atomizing head. 4,512,518, Cl. 239-223.000.

Inwood, Louis R. Dermatological composition useful in the treatment of psoriasis. 4,512,978, Cl. 424-145.000.

Ipri, Alfred C.; and Stewart, Roger G., to RCA Corporation. Electrically alterable, nonvolatile floating gate memory device. 4,513,397, Cl. 365-185.000.

Irabu, Takeru, to Nippon Electric Co., Ltd. Adaptive constant false alarm rate (CFAR) processor. 4,513,286, Cl. 343-5.0CF.

Irex Corporation: *See*—
Cimilluca, Charles I., 4,512,350, Cl. 128-660.000.

Irwin, George W.; and Mumford, Eustace H., to Owens-Illinois, Inc. Cooling wind shut-off valve for glass forming mold. 4,512,792, Cl. 65-161.000.

Isayama, Katsuhiko: *See*—
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,513,061, Cl. 428-429.000.

Isham, Robert O.; and Reese, Wayne S. Van sofa bed. 4,512,048, Cl. 5-37.00R.

Ishida, Masato; and Takeda, Hiroaki, to Canon Kabushiki Kaisha. Image reproducing apparatus. 4,512,655, Cl. 355-55.000.

Ishigaki Kiko Co., Ltd.: *See*—
Noda, Ichiro; Suekane, Yasuhiro; and Nakao, Hisao, 4,512,889, Cl. 210-225.000.

Ishigami, Yoshihisa; Hashimota, Yasumasa; Kitado, Tadaharu; Nishimura, Hiromi; and Mori, Tetsuo, to Matsushita Electric Works, Ltd. Current detecting apparatus. 4,513,339, Cl. 361-45.000.

Ishihara, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Positioning servo circuit for a disk system. 4,513,406, Cl. 369-32.000.

Ishihara, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Microwave ground shield structure. 4,513,266, Cl. 333-238.000.

Ishikawa, Kazuo, to Aisin Seiki Kabushiki Kaisha. Vehicle automatic power transmission having a lock up clutch. 4,512,212, Cl. 74-733.000.

Ishikawa, Norio: *See*—
Kitaura, Mashio; Ishikawa, Norio; and Ishimura, Toshihiko, 4,512,646, Cl. 354-409.000.

Ishimura, Toshihiko: *See*—
Kitaura, Mashio; Ishikawa, Norio; and Ishimura, Toshihiko, 4,512,646, Cl. 354-409.000.

Isida, Tosio: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,512,893, Cl. 210-500.200.

Isobe, Asao; Makino, Daisuke; and Shiraishi, Hiroshi, to Hitachi Chemical Company, Ltd.; and Hitachi, Ltd. Electron beam or X-ray reactive image-formable resinous composition. 4,513,077, Cl. 430-270.000.

Isobe, Toshiaki: *See*—
Ito, Toshimitsu; and Isobe, Toshiaki, 4,512,318, Cl. 123-492.000.

Isogai, Tokio: *See*—
Shoji, Fusaji; Takemoto, Issei; Kataoka, Fumio; Yokono, Hitoshi; and Isogai, Tokio, 4,513,132, Cl. 528-21.000.

Ito, Fumio: *See*—
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, 4,512,656, Cl. 354-475.000.

Ito, Shoichi: *See*—
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.

Ito, Tadashi: *See*—
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, 4,512,656, Cl. 354-475.000.

Ito, Tokuhisa; Ohno, Hideaki; Kurata, Izumi; and Okuyama, Takashi, to Ashai Kogaku Kogyo Kabushiki Kaisha. Automatic focusing apparatus in optical drawing machine. 4,512,642, Cl. 354-4.000.

Ito, Toshimitsu; and Isobe, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with fuel injection system. 4,512,318, Cl. 123-492.000.

Ito, Yasunori: *See*—
Ohta, Hideo; Hakuzen, Tatuzo; Ito, Yasunori; and Takagi, Fusao, 4,512,829, Cl. 156-659.100.

Itoh, Satoru, to Fuji Xerox Co., Ltd. Image outputting device. 4,513,325, Cl. 358-280.000.

Itoi, Hiroshi: *See*—
Komiyama, Noboru; Itoi, Hiroshi; and Sano, Hiroshi, 4,512,968, Cl. 424-48.000.

Itou, Takaaki: *See*—
Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Takimoto, Masatami; and Teramura, Mitsuyoshi, 4,512,312, Cl. 123-439.000.

Itow, Hisao: *See*—
Mori, Yasuhiko; Hattori, Shigeo; Masaoka, Isao; and Itow, Hisao, 4,512,820, Cl. 148-12.70N.

Ives, Neil A.: *See*—
Marvin, Dean C.; and Ives, Neil A., 4,513,200, Cl. 250-227.000.

Ivins, James M. Thermometer for obtaining the temperature of horse. 4,512,668, Cl. 374-194.000.

Iwamoto, Kenzi: *See*—
Igashira, Toshihiko; Kawai, Hisasi; Tanaka, Takeshi; Iwamoto, Kenzi; Abe, Seiko; and Hashimoto, Eiji, 4,512,307, Cl. 123-383.000.

Iwata, Tadao: *See*—
Mizui, Kinya; Takeda, Masami; and Iwata, Tadao, 4,513,130, Cl. 526-283.000.

Iwatsu Electric Co., Ltd.: *See*—
Kokaji, Norio, 4,513,326, Cl. 358-301.000.

Izzo, Kenneth R.: *See*—
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., 4,512,179, Cl. 73-4.00R.

J.H. Fenner & Co. Limited: *See*—
Hayhurst, Gordon A.; and Rayner, David A., 4,512,681, Cl. 403-371.000.

J. Mulcahy Enterprises Incorporated: *See*—
Mulcahy, Joseph A., 4,512,799, Cl. 75-49.000.

Jabarin, Saleh A., to Owens-Illinois, Inc. Method for making poly(ethylene terephthalate) article. 4,512,948, Cl. 264-521.000.

Jachimowicz, Felek: *See*—
Hansson, P. E. Anders; and Jachimowicz, Felek, 4,513,122, Cl. 525-332.300.
Hansson, Per E. A.; and Jachimowicz, Felek, 4,513,121, Cl. 525-332.300.

Jackson, L. Robert; Davis, Randall C.; and Taylor, Allan H., to United States of America, National Aeronautics and Space Administration. Daze fasteners. 4,512,699, Cl. 411-368.000.

Jacobine, Anthony F., to Loctite Corporation. Soluble sulfimide accelerators for free radical cured compositions. 4,513,127, Cl. 526-194.000.

Jacobs, Brian E.: *See*—
Ellis, Roland, Jr.; Jacobs, Brian E.; March, Edward J.; and Newman, Raymond J., 4,512,509, Cl. 228-180.200.
Jacobs, George S.; and Anderson, R. David. Pilot valve for an oil and gas separator. 4,512,365, Cl. 137-413.000.
Jacobson, Clayton J. Interface for water cooled engine manifolds. 4,512,148, Cl. 60-321.000.
Jacobstein, Benjamin, to Scientific Technology, Ltd. Contact lens handling device. 4,512,601, Cl. 294-1.200.
Jagenberg AG: *See*—
Hennig, Franz, 4,512,379, Cl. 141-286.000.
Jakobsen, Kjell M.: *See*—
Nilsson, Torsten; and Jakobsen, Kjell M., 4,512,735, Cl. 425-526.000.
James, Dean B.: *See*—
Anstine, Larry D.; James, Dean B.; Melaika, Edward A.; and Peterson, John P., Jr., 4,512,921, Cl. 252-626.000.
Jamieson Film Company: *See*—
Engelhardt, Billy M.; and Moore, Dwane L., 4,512,645, Cl. 354-324.000.
Jamieson, William B.: *See*—
Baker, Stephen R.; Jamieson, William B.; Ross, William J.; and Todd, Alec, 4,513,005, Cl. 514-451.000.
Jamiolkowski, Michael J.; and Campbell, Jules D., Jr., to Motorola, Inc. Single input oscillator circuit. 4,513,258, Cl. 331-111.000.
Jamison, Matthew; and Sharp, Charles C. Beehive ventilator. 4,512,050, Cl. 6-1.000.
Jandrasi, Frank J.; Pampell, Davy G.; and Stinson, Walter J., to General Signal Corporation. Slide valve. 4,512,363, Cl. 137-375.000.
Jansen, Frank; and Mort, Joseph, to Xerox Corporation. Process for amorphous silicon films. 4,513,022, Cl. 427-39.000.
Janssen, Caleb E., to Lockheed Corporation. Tool for installing electrical wire harness clamps and the like. 4,512,219, Cl. 81-121.100.
Japan Electronic Control Systems Company, Limited: *See*—
Tomisawa, Naoki, 4,512,315, Cl. 123-478.000.
Jarrett, David W. Compound lever bow. 4,512,326, Cl. 124-23.00R.
Jarund, Erik, to Tetra Pak International AB. Suction tube package. 4,512,472, Cl. 206-443.000.
Jarvis, James G.: *See*—
Ng, Yee S.; Jarvis, James G.; and Thompson, John R., 4,512,653, Cl. 355-16.000.
Jarvis, N. Lynn: *See*—
Hannan, Patrick J.; Stiffey, Arthur V.; Jarvis, N. Lynn; and Wohltjen, Henry, 4,513,280, Cl. 340-632.000.
Jayant, Nuggehally S., to AT&T Bell Laboratories. Adaptive differential pulse code modulation. 4,513,426, Cl. 375-26.000.
Jaycox, Donald F.: *See*—
Suffi, Louis; Golden, James E.; and Jaycox, Donald F., 4,513,171, Cl. 174-41.000.
Jayem Dialer Corp.: *See*—
Smith, Fred J., 4,513,175, Cl. 179-18.0BA.
Jeffrey, Frank R., III; and Shirck, James R., to Minnesota Mining and Manufacturing Company. Layered photoconductive element. 4,513,073, Cl. 430-65.000.
Jennette, William S. Pull plow with pull handles and runners and automobile selectively attached to plow. 4,512,415, Cl. 172-360.000.
Jensen, Torkil D., to F. L. Smidth & Co. A/S. Bridge scraper for direct material feeding. 4,512,458, Cl. 198-507.000.
Jerhammar, Lars O. Navigational aid device. 4,512,087, Cl. 33-431.000.
Jerus, Paul: *See*—
Clearfield, Abraham; and Jerus, Paul, 4,512,905, Cl. 252-62.200.
Jewell, Donald K.: *See*—
Schindler, James C.; and Jewell, Donald K., 4,512,250, Cl. 99-425.000.
Jidosha Kiki Co., Ltd.: *See*—
Endoh, Kazunori; and Suzuki, Haruo, 4,512,237, Cl. 91-369.00A.
Jimenez, Raul. Carriage for a trimming device. 4,512,143, Cl. 56-16.700.
Jimmy's Radio & Television Corp.: *See*—
Hills, Joseph F., 4,513,405, Cl. 369-12.000.
Joannic, Michel; Roquet, Francoise; and Pesson, Marcel, to Laboratoire Roger Bellon. β-Adrenergic 1-[1-benzimidazolyl]-N-[2-(4-hydroxy-3-methoxy-phenyl)-2-hydroxy-ethyl]-3-amino butane and salts and hydrates thereof. 4,513,001, Cl. 514-394.000.
Jobe, Howard L. Golf bag accessory. 4,512,465, Cl. 206-315.400.
Johanning, Hermann, to Engelbrecht & Lemmerbrock GmbH & Co. Apparatus for granulating and conveying corn-cob mix. 4,512,521, Cl. 241-34.000.
Johansson, Hans L., to Facit Aktiebolag. Locking assembly for restricting pivotal movement of a print unit to a position in which a print element can be replaced. 4,512,676, Cl. 400-144.200.
John Zink Company: *See*—
Cegielski, John M., Jr.; Campbell, Gerald D.; and Schaub, Clyde D., 4,512,267, Cl. 110-347.000.
Johnson, Donald F.: *See*—
Patil, Ram S.; Johnson, Donald F.; and Quasney, John T., 4,513,033, Cl. 427-349.000.
Johnson & Johnson Dental Products Company: *See*—
Santucci, Edward A.; and Racz, William B., 4,512,743, Cl. 433-217.000.
Johnson & Johnson Products, Inc.: *See*—
Buck, Carl J., 4,512,340, Cl. 128-90.000.
Johnson, Mark E. Flying figure toy glider. 4,512,690, Cl. 446-61.000.
Johnson, Violet M. Support cushion. 4,512,047, Cl. 5-432.000.
Johnston, David B. R., to Merck & Co., Inc. 3-Acyl-2-amino-5-halo-6-(substituted)pyrazine antimicrobial compounds. 4,512,991, Cl. 514-252.000.
Jolly, Jean: *See*—
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,513,147, Cl. 562-506.000.
Jones, Andrew J. S.; Olson, Kenneth C.; and Shire, Steven J., to Genentech, Inc. Purification and activity assurance of precipitated heterologous proteins. 4,512,922, Cl. 260-112.00R.
Jones, Bryan E.; and Kunesch, Anthony M., to Film Cooling Towers Limited. Undulating heat exchange packing. 4,512,938, Cl. 261-112.000.
Jones, Donald K.: *See*—
Ackermann, Albert B.; Jones, Donald K.; and Holey, Timothy M., 4,512,539, Cl. 244-137.00P.
Jones, Flave L.; and Kelly, Mark L., to American Home Products Corporation (Del.). Method for recording medical information on a strip chart. 4,513,295, Cl. 346-33.0ME.
Jones, Jesse D., to Ethyl Corporation. Thermoplastic PVC molding compositions. 4,513,108, Cl. 524-180.000.
Jones, John E.: *See*—
Laing, Gordon E.; Harbeck, Martin E.; Jones, John E.; Sumerau, William R.; and Glenn, William K., III, 4,512,057, Cl. 15-320.000.
Jones, Robert A., to Perkin-Elmer Corporation, The. Automated polisher for cylindrical surfaces. 4,512,107, Cl. 51-56.00R.
Jordan, James M.: *See*—
Horak, Charles F.; and Jordan, James M., 4,512,053, Cl. 15-28.000.
Josephson, Elliot, to Astec Components, Ltd. Electronic ballast-inverter circuit. 4,513,226, Cl. 315-219.000.
Jouanin, Andre : *See*—
Faure, Michel; Regeffe, Jean Y.; Lumineau, Yves; and Jouanin, Andre , 4,512,790, Cl. 65-13.000.
Juckett, David W., to Sandy Hill Corporation. Slitting apparatus and method. 4,512,226, Cl. 83-56.000.
Jullien, Gerard M. R., to L'Equipement et la Construction Electrique en abrege E.C.E. Push-button controlled miniaturized thermal cutout/switch. 4,513,275, Cl. 337-66.000.
Jung, Johann: *See*—
Rieber, Norbert; Platz, Rolf; and Jung, Johann, 4,512,795, Cl. 71-88.000.
Juntti, Lars. Lightbulb socket. 4,513,182, Cl. 200-51.090.
K-Tron International, Inc.: *See*—
Bullivant, Kenneth W., 4,512,428, Cl. 177-25.000.
Kaburagi, Katsuhiko: *See*—
Kaminaka, Motofumi; Takashima, Hiroyuki; and Kaburagi, Katsuhiko, 4,512,368, Cl. 137-561.00A.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Minamida, Kazukiyo, 4,512,427, Cl. 177-1.000.
Kabushiki Kaisha Kansai Kougu Seisakusho: *See*—
Shigemizu, Akihiko, 4,512,524, Cl. 241-101.700.
Kabushiki Kaisha Kindai: *See*—
Terauchi, Isamu, 4,512,224, Cl. 82-48.000.
Kabushiki Kaisha Kito: *See*—
Nakamura, Takayoshi, 4,512,555, Cl. 254-350.000.
Kabushiki Kaisha Kyoto Daiichi Kagaku: *See*—
Uchigaki, Takatoshi; Saito, Akio; and Yamada, Naoki, 4,512,348, Cl. 128-632.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Shibata, Shin; Aoyama, Akira; and Mino, Tetsuya, 4,513,337, Cl. 360-121.000.
Kabushiki Kaisha Takuma: *See*—
Shigaki, Masanobu, 4,512,266, Cl. 110-204.000.
Kabushiki Kaisha Tokyo Keiki: *See*—
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Kabushiki Kaisha Toshiba: *See*—
Matsuda, Naotoshi; Tetsuishi, Yoshinori; and Higuchi, Kazuaki, 4,512,912, Cl. 252-301.60S.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Aoyama, Shigetsune; Yoshikawa, Kazuo; Hasegawa, Yoshimichi; and Higuchi, Junichi, 4,512,559, Cl. 267-47.000.
Kuno, Toshitaka; Moribe, Hiroshi; and Miyamoto, Shojirou, 4,513,231, Cl. 318-341.000.
Kabushiki Kaisha Yakult Honsha: *See*—
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,513,138, Cl. 546-48.000.
Kaesser, Merle L., to Deere & Company. Variable flow turbine. 4,512,714, Cl. 415-151.000.
Kaganowicz, Grzegorz: *See*—
Robinson, John W.; and Kaganowicz, Grzegorz, 4,512,284, Cl. 118-723.000.
Kagawa, Fukashi: *See*—
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Kagiwada, Reynold S.: *See*—
Yen, Kuo-Hsiung; Stokes, Robert B.; Lau, Kei-Fung; Kong, Alvin M.; and Kagiwada, Reynold S., 4,513,261, Cl. 333-194.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Hsu, Yu-Wen, 4,512,170, Cl. 72-17.000.
Kaku, Yoshihiro; and Otsu, Keiichiro, to Taiho Kogyo Co., Ltd. Swash plate type compressor shoe and manufacturing method therefor. 4,512,175, Cl. 72-360.000.
Kakumoto, Hideki: *See*—
Tsuchida, Tsuyoshi; Kido, Yoshinobu; Kakumoto, Hideki; and Tanaka, Yuzuru, 4,512,313, Cl. 123-440.000.
Kaltz, Milton C.: *See*—
Trostle, D. Mark; Kaltz, Milton C.; Moler, Ronald; and Cowsert, Lendell E., 4,512,606, Cl. 296-130.000.

Kam, Anthony Y.: *See—*
Avidan, Amos A.; and Kam, Anthony Y., 4,513,160, Cl. 585-640.000.
Kamata, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrical switchgear. 4,513,208, Cl. 307-139.000.
Kaminaka, Motofumi; Takashima, Hiroyuki; and Kaburagi, Katsuhiko, to Sumitomo Metal Industries, Ltd. Fluid distributor. 4,512,368, Cl. 137-561.00A.
Kamiya, Kenji; and Hosoi, Masatoshi, to Ricoh Watch Co., Ltd. Scoring system. 4,512,229, Cl. 84-1.010.
Kamiya, Masashi; Ueda, Katsunobu; Sumiya, Mitsuo; and Tsukada, Tameyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotating mirror scanner. 4,512,626, Cl. 350-6.800.
Kamiya, Takashi: *See—*
Negi, Shigeto: Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; Saito, Isao; and Kitoh, Kyosuke, 4,513,145, Cl. 549-402.000.
Kamiya, Tuyoshi: *See—*
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Kamiya, Yasuhisa: *See—*
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Kamp, Ewald A., to Union Carbide Corporation. Adhesive closure bags and method for producing same. 4,513,445, Cl. 383-87.000.
Kampf, Eberhard. Winding machine. 4,512,529, Cl. 242-67.10R.
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., to Chemische Werke Huels AG. Process for the silylation of unsaturated, naturally occurring oils or the interesterification products thereof. 4,512,926, Cl. 260-398.000.
Kanada, Sadaoki: *See—*
Katayama, Sakae; Asano, Tadahiko; Marugame, Kazuo; Kanada, Sadaoki; and Kawasaki, Yoshinari, 4,512,552, Cl. 253-389.00R.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, 4,513,061, Cl. 428-429.000.
Kaneko, Masayasu: *See—*
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Kaniadakis, Steven J. Orthodontic rubber band applicator. 4,512,739, Cl. 433-3.000.
Kanno, Tetuo: *See—*
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Kant, Rajni: *See—*
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Kanzaki Paper Manufacturing Company Limited: *See—*
Takayama, Yukio; Noguchi, Akio; and Matsushita, Takao, 4,513,301, Cl. 346-200.000.
Kapral, Christopher W., to GTE Communications Products Corporation. Charge redistribution mu-law PCM decoder. 4,513,279, Cl. 340-347.0DA.
Karagoz, Berch Y.; Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., to Great Lakes Carbon Corporation. Composite electrode for arc furnace. 4,513,425, Cl. 373-88.000.
Karanewsky, Donald S.: *See—*
Weller, Harold N., III; Gordon, Eric M.; Karanewsky, Donald S.; and Ryono, Denis E., 4,512,988, Cl. 514-211.000.
Karl Liebinger Medizintechnik GmbH & Co.: *See—*
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Kasei Optonix, Ltd.: *See—*
Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,512,911, Cl. 252-301.40H.
Kashima Oil Company Limited: *See—*
Watanabe, Masami, 4,512,874, Cl. 208-44.000.
Kason Industries Inc.: *See—*
Berkowitz, Irving L., 4,512,122, Cl. 52-127.900.
Kassel, Karlheinz: *See—*
Dulken, Hartmut; Kassel, Karlheinz; Mows, Wolfgang; and Walsdorfer, Hubert, 4,513,072, Cl. 430-57.000.
Kaster, Robert L.; and Domaas, Perry M., to Angicor Limited. Storage unit. 4,512,471, Cl. 206-438.000.
Kataoka, Fumio: *See—*
Shoji, Fusaji; Takemoto, Issei; Kataoka, Fumio; Yokono, Hitoshi; and Isogai, Tokio, 4,513,132, Cl. 528-21.000.
Katayama Chemical Works Co., Ltd.: *See—*
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Katayama, Sakae; Asano, Tadahiko; Marugame, Kazuo; Kanada, Sadaoki; and Kawasaki, Yoshinari, to Katayama Chemical Works Co., Ltd. Corrosion inhibitor. 4,512,552, Cl. 253-389.00R.
Kateka B.V.: *See—*
Knaap, Jan J., 4,512,244, Cl. 98-98.000.
Kato, Nobuhide; and Murase, Takao, to NGK Insulators, Ltd. Oxygen sensor with heater. 4,512,871, Cl. 204-429.000.
Kato, Yutaka: *See—*
Oshima, Masao; Kato, Yutaka; Ogasawara, Mitsuhiko; and Futamura, Osamu, 4,512,936, Cl. 261-93.000.
Katou, Takashi: *See—*
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Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Vibration wave motor. 4,513,219, Cl. 310-328.000.
Katz, Joseph; Yariv, Amnon; and Margalit, Shlomo, to United States of America, National Aeronautics and Space Administration. Arrangement for damping the resonance in a laser diode. 4,513,423, Cl. 372-50.000.
Katz, Saul N.; and Proscia, George E., to General Foods Corporation. Process for recovering caffeine from activated carbon. 4,513,136, Cl. 544-275.000.
Katzenstein, Jack. System and method for impact welding by magnetic implosion. 4,513,188, Cl. 219-9.500.
Kaube, Peter; Schanz, Karl-Heinz; Vetter, Heinz; and Muller, Jens, to Rohm GmbH Chemische Fabrik. Webbed multiple sheets. 4,513,048, Cl. 428-188.000.
Kauffman, Kenneth W., to Kauffman, Kenneth W. Variable effect absorption machine and process. 4,512,394, Cl. 165-86.000.
Kawabata, Yasuhiro; and Akagi, Motonobu, to Aisin Seiki Kabushiki Kaisha. Turbocharger control system. 4,512,153, Cl. 60-611.000.
Kawada, Yasuyuki: *See—*
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Kawai, Hisasi: *See—*
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Kawai Musical Instrument Mfg. Co., Ltd.: *See—*
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Kawakubo, Fumio; Hirose, Toshifumi; Minokami, Tadashi; Hosaka, Miyako; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Primer composition. 4,513,061, Cl. 428-429.000.
Kawamura, Eiichi: *See—*
Kubo, Keishi; and Kawamura, Eiichi, 4,513,052, Cl. 428-219.000.
Kawamura, Masaharu: *See—*
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, 4,512,656, Cl. 354-475.000.
Kawanaka, Ryusuke: *See—*
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Kawasaki, Yoshinari: *See—*
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Keesee, Kenneth C.; and Ruckman, James A., to Westvaco Corporation. Portable earth anchor. 4,512,132, Cl. 52-742.000.
Keller, Frederick A., Jr.; Ganoung, Jeffrey S.; and Luenser, Susan J., to CPC International Inc. Mutant strain of *Clostridium thermoaceticum* useful for the preparation of acetic acid. 4,513,084, Cl. 435-140.000.
Keller, Jakob, to BBC Brown, Boveri & Company, Limited. Valve with a device for the attenuation of acoustic vibrations self-excited by the working medium. 4,512,548, Cl. 251-124.000.
Kelly, Mark L.: *See—*
Jones, Flave L.; and Kelly, Mark L., 4,513,295, Cl. 346-33.0ME.
Kelly, Richard L.: *See—*
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KemaNord AB: *See—*
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Kemme, Joseph E.: *See—*
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Kendall Company, The: *See—*
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Kenrich Petrochemicals, Inc.: *See—*
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Kerbel, Sheldon J.: *See—*
St. John, Karl M.; Reeber, Nicholas J.; and Kerbel, Sheldon J., 4,513,314, Cl. 358-76.000.
Kerklies, Bodo, to Gewerkschaft Eisenhutte Westfalia. Guide assembly for a curved section of a scraper-chain conveyor. 4,512,459, Cl. 198-729.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Struck, Bernd D.; Dias, Francisco J.; Luhleich, Hartmut; and Paffen nee Siebert, Ursula, 4,512,858, Cl. 204-104.000.
Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., to National Semiconductor Corporation. Simplified BIFET process. 4,512,815, Cl. 148-1.500.
Khadder, Wadie N.: *See—*
Ramde, Amolak R.; Khadder, Wadie N.; and Krishna, Surinder, 4,512,816, Cl. 148-1.500.
Kidde, Inc.: *See—*
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Tsuchida, Tsuyoshi; Kido, Yoshinobu; Kakumoto, Hideki; and Tanaka, Yuzuru, 4,512,313, Cl. 123-440.000.
Kieffer, Eduard P.; and Sie, Swan T., to Shell Oil Company. Process for improving the quality of catalytically cracked gasoline. 4,512,877, Cl. 208-136.000.
Kikukawa, Noriyuki; and Yamada, Yasuaki, to Canon Kabushiki Kaisha. Control method for stepping motor. 4,513,236, Cl. 318-696.000.
Kim, Gwan: *See—*
Peters, Alan W.; Kim, Gwan; and Ernest, Michael V., 4,513,101, Cl. 502-304.000.
Kim, Kee: *See—*
Hinojosa, Alberto L.; Kim, Kee; and Chickering, Kenton, III, 4,512,359, Cl. 137-315.000.

Kim, Wan J.; Lee, Cheol H.; and Lee, Moon H., to Korea Advanced Institute of Science and Technology. Method of preparation of 3-methylene cepham compounds. 4,513,134, Cl. 544-16.000.

Kimex International Technologies, Inc.: *See*—
King, Wladimir S., 4,512,333, Cl. 126-429.000.

Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Apparatus for preparing high-melting-point high-toughness metals. 4,512,557, Cl. 266-171.000.

Kimura, Keizo: *See*—
Okazaki, Masaki; Tanabe, Osami; Nagaoka, Satoshi; Mihara, Yuji; Kimura, Keizo; and Umemoto, Makoto, 4,513,081, Cl. 430-550.000.

King, James L. In-cassette loading machine. 4,512,904, Cl. 242-56.00R.

King, Shaylor E., to QMP, Inc. Collapsible strut with pivot joint connector. 4,512,600, Cl. 292-338.000.

King, Wladimir S., to Kimex International Technologies, Inc. Solar collector panel and method. 4,512,333, Cl. 126-429.000.

Kinoshita, Takao; and Sakai, Shinji, to Canon Kabushiki Kaisha. Solid state imaging device. 4,513,313, Cl. 358-44.000.

Kirk, J. David. Internal combustion engine. 4,512,291, Cl. 123-56.0BC.

Kishida, Kazuo; Yamamoto, Naoki; Nishida, Kozi; Narita, Toshihito; and Sato, Yasumasa, to Mitsubishi Rayon Co., Ltd. Process for producing impact-resistant resins. 4,513,111, Cl. 524-458.000.

Kishimoto, Syoji, to Mitsubishi Denki Kabushiki Kaisha. Rotary armature with cooling of commutator. 4,513,217, Cl. 310-227.000.

Kita, Masakazu: *See*—
Tanabe, Toshio; and Kita, Masakazu, 4,512,077, Cl. 30-43.000.

Kita, Yasuo; Moriya, Michio; and Yoshida, Kenichi, to Sumitomo Electric Industries, Ltd. Brake controller. 4,512,615, Cl. 303-97.000.

Kitado, Tadaharu: *See*—
Ishigami, Yoshihisa; Hashimota, Yasumasa; Kitado, Tadaharu; Nishimura, Hiromi; and Mori, Tetsuo, 4,513,339, Cl. 361-45.000.

Kitagawa, Hiroshi: *See*—
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Kitagawa Industries Co., Ltd.: *See*—
Matsui, Kazuhiro, 4,513,172, Cl. 174-65.0SS.

Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, to Nippon Soken, Inc. Liquid quantity detecting device. 4,512,189, Cl. 73-296.000.

Kitahara, Hajimu: *See*—
Oi, Naobumi; and Kitahara, Hajimu, 4,512,898, Cl. 210-656.000.

Kitamoto, Tatsuji; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,513,054, Cl. 428-329.000.

Kitamura, Sotoo: *See*—
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,512,189, Cl. 73-296.000.

Kitasato Institute, The: *See*—
Umezawa, Iwao; Komiyama, Kanki; and Takeshima, Hideo, 4,512,976, Cl. 424-122.000.

Kitaura, Mashio; Ishikawa, Norio; and Ishimura, Toshihiko, to Minolta Camera Kabushiki Kaisha. Acoustic indicating device for cameras. 4,512,646, Cl. 354-409.000.

Kitaura, Yoshihiko, Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co. Ltd. Peptide, process for preparation thereof and use thereof. 4,512,980, Cl. 514-18.000.

Kitoh, Kyosuke: *See*—
Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; Saito, Isao; and Kitoh, Kyosuke, 4,513,145, Cl. 549-402.000.

Kitzis, Stanley: *See*—
Michnick, Bruce T.; and Kitzis, Stanley, 4,512,744, Cl. 433-229.000.

Kiya, Nobuyuki: *See*—
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,513,234, Cl. 318-594.000.

Klaila, William J. Racket having a refrigerant contained therein for heat dissipation. 4,512,574, Cl. 273-73.00J.

Klauke, Erich: *See*—
Kuhle, Engelbert; Klauke, Erich; Paulus, Wilfried; and Genth, Hermann, 4,513,003, Cl. 514-411.000.

Klein, Philipp H.: *See*—
Addamiano, Arrigo; and Klein, Philipp H., 4,512,825, Cl. 148-175.000.

Kleinhappl, Erich: *See*—
Marsoner, Hermann; Ritter, Christoph; Kleinhappl, Erich; and Strutz, Winfried, 4,512,953, Cl. 422-67.000.

Klinger AG: *See*—
Sledmere, Alan B., 4,512,190, Cl. 73-319.000.

Klinkowski, Peter R., to Dorr-Oliver. Producing a solid polymeric electrolyte. 4,513,032, Cl. 427-336.000.

Klinner, Wilfred E., to National Research De Development. Crop engaging device. 4,512,146, Cl. 56-364.000.

Klotz, Erhard: *See*—
Weiss, Hermann; Linde, Rolf; Tiemens, Ulf; and Klotz, Erhard, 4,513,433, Cl. 378-2.000.

Knaap, Jan J., to Kateka B.V. Ventilation grating for use in window frames together with sealed unit insulating glass. 4,512,244, Cl. 98-98.000.

Knapke, Paul H.; and Miller, Robert L., to International Telephone and Telegraph Corporation. Clocking arrangement for telephone switching system. 4,513,414, Cl. 370-58.000.

Knighton, David R.: *See*—
Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, 4,512,349, Cl. 128-632.000.

Knisley, Rondel. Apparatus for drilling oil and gas wells and a torque arrestor associated therewith. 4,512,422, Cl. 175-99.000.

Knoblauch, Georg, to Georg Knoblauch GmbH. Drill-bit index case. 4,512,467, Cl. 206-379.000.

Knosel, Johann: *See*—
Falk, Ernst; and Knosel, Johann, 4,512,343, Cl. 128-303.170.

Knox, Bruce R.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,513,439, Cl. 382-7.000.

Knutson, Richard K.: *See*—
Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J., 4,513,016, Cl. 426-554.000.

Kobayashi, Hiroshi, to Nissan Motor Company, Limited. Method of making liquid container having electrode plates to detect liquid level by measuring capacitance. 4,512,067, Cl. 29-25.410.

Kobayashi, Hiroshi; and Kousaka, Michio, to Toyo Seikan Kaisha Limited. Stopper assembly for medical liquid container and method and apparatus for manufacturing the same. 4,512,486, Cl. 215-249.000.

Kobayashi, Takahide, to Koken Co., Ltd. Lens working apparatus. 4,512,108, Cl. 51-101.0LG.

Kobayashi, Yuji; and Okada, Takao, to Dai Nippon Printing Co., Ltd.; and Ikegami Tsushinki Co., Ltd. Automatic surface inspection system. 4,513,316, Cl. 358-106.000.

Kobelt, Jacob. Single lever control assembly to permit disengagement between two functions. 4,512,451, Cl. 192-0.096.

Koberlein, Ross D., to Bettendorf Stanford Inc. Bread loaf processing. 4,512,137, Cl. 53-435.000.

Kobiella, Robert J., to Signode Corporation. Anvil, gripper, and cutter assembly in a strapping machine. 4,512,844, Cl. 156-510.000.

Kobler, Ingo, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Apparatus for joining a plurality of super-imposed webs received from a rotary printing machine. 4,512,845, Cl. 156-548.000.

Koch, Jakob: *See*—
Frei, Siegfried; and Koch, Jakob, 4,512,490, Cl. 220-72.000.

Kocher, Erich J., to Vilter Manufacturing Corporation. Sealing means for valve spindle. 4,512,550, Cl. 251-214.000.

Kocher, Haribhajan S., to Eastman Kodak Company. Fuser apparatus having a uniform heat distribution. 4,512,650, Cl. 355-3.0FU.

Kochs Adler AG: *See*—
Landwehr, Gunter, 4,512,272, Cl. 112-311.000.

Kocks Technik GmbH & Co.: *See*—
Brauer, Hans; and Gerhards, Hans-Dieter, 4,512,173, Cl. 72-98.000.

Koepke, Jeffery W.: *See*—
Young, Dean A.; and Koepke, Jeffery W., 4,513,158, Cl. 585-527.000.

Kohara, Satsuki; and Ono, Noriaki, to Olympus Optical Co., Ltd. Chemically sensitive element. 4,512,870, Cl. 204-416.000.

Kohler Co.: *See*—
Striegel, William H.; and Schmitz, Willard H., 4,512,042, Cl. 4-496.000.

Kohn, Ernest O.: *See*—
Abbott, James B.; Kohn, Ernest O.; Berry, Christopher; and Slade, Mark N., 4,512,172, Cl. 72-68.000.

Kohrn, Robert C., to Uniroyal Inc. Method of making reduced noise positive drive power transmission system. 4,512,834, Cl. 156-138.000.

Kokaji, Norio, to Iwatsu Electric Co., Ltd. Magnetic printing machine employing a multi-channel recording head with minimal cross-talk with secondary scanning head movement. 4,513,326, Cl. 358-301.000.

Koken Co., Ltd.: *See*—
Kobayashi, Takahide, 4,512,108, Cl. 51-101.0LG.

Kokubo, Masahiro: *See*—
Sakurada, Satoshi; Hashimoto, Takao; Tagaya, Nobuaki; Maeshima, Tsugio; Ueda, Kayako; and Kokubo, Masahiro, 4,513,166, Cl. 585-832.000.

Kolde, Richard A.: *See*—
Hennekes, Daniel M.; Kolde, Richard A.; and Suica, David E., 4,512,709, Cl. 414-729.000.

Kolinsky, Jiri: *See*—
Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, 4,512,923, Cl. 260-112.5LH.

Kollanyi, Miklos J., to GTE Lenkurt Incorporated. Overvoltage protection circuit for power supply. 4,513,341, Cl. 361-91.000.

Kolton, Chester; and Spater, Stuart S., to B & G Plastics, Inc. Integral tag and tie. 4,512,093, Cl. 40-20.00R.

Komiyama, Kanki: *See*—
Umezawa, Iwao; Komiyama, Kanki; and Takeshima, Hideo, 4,512,976, Cl. 424-122.000.

Komiyama, Noboru; Itoi, Hiroshi; and Sano, Hiroshi, to Lion Corporation. Oral compositions. 4,512,968, Cl. 424-48.000.

Komoto, Tetsuo: *See*—
Etou, Kazumi; and Komoto, Tetsuo, 4,512,162, Cl. 62-298.000.

Kompanek, Harry W.; Ligman, James R.; and Plambeck, Eric D., to Sona-Tool Development Ltd. Casing tuned downhole tool. 4,512,402, Cl. 166-249.000.

Kondo, Kenshi, to Nihon Den-Nitsu Keiki Co. Ltd. Printed circuit board soldering apparatus. 4,512,510, Cl. 228-40.000.

Kone, Ali: *See*—
Carette, Brigitte; Kone, Ali; Souquet, Jean-Louis; Ribes, Michel; and Maurin, Maurice, 4,513,070, Cl. 429-193.000.

Konegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamazaki, Kaoru; and Shibuya, Fukashi, 4,513,126, Cl. 526-87.000.

Kong, Alvin M.: *See*—
Yen, Kuo-Hsiung; Stokes, Robert B.; Lau, Kei-Fung; Kong, Alvin M.; and Kagiwada, Reynold S., 4,513,261, Cl. 333-194.000.

Konishi, Satoshi: *See*—
Ohno, Junichi; and Konishi, Satoshi, 4,513,310, Cl. 357-68.000.

Konishi, Tadashi: *See*—
Kunugi, Katsuo; Suzuki, Togi; Konishi, Tadashi; and Ohwaki, Shinji, 4,513,114, Cl. 524-706.000.

Konrad, Peter; and Mechel, Adam, to Wassermesserfabrik ANDRAE GmbH & Co. Flow volumeter for liquids. 4,512,201, Cl. 73-861.790.

Koos, Inc.: *See*—
McConnell, Forrest M., 4,512,907, Cl. 252-70.000.

Koppensteiner, Werner, to Otis Elevator Company. Elevator buffer. 4,512,444, Cl. 187-67.000.

Koppers Company, Inc.: *See*—
Wallace, William E.; and Pourarian, Faiz, 4,512,965, Cl. 423-644.000.

Korea Advanced Institute of Science and Technology: *See*—
Kim, Wan J.; Lee, Cheol H.; and Lee, Moon H., 4,513,134, Cl. 544-16.000.

Korsunsky, Iosif: *See*—
Bakermans, Johannes C. W.; Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,513,353, Cl. 361-399.000.

Korte, Ralph J., to Champion International Corporation. Paperboard carton with improved perforated opening and method of making same. 4,512,478, Cl. 206-611.000.

Kos, Bernd, to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW). Work-hardenable austenitic manganese steel and method for the production thereof. 4,512,804, Cl. 75-123.00N.

Koser, Gerald F.; and Carman, Carol S., to University of Akron, The. Iodonium salts. 4,513,137, Cl. 546-14.000.

Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, to Kasei Optonix, Ltd. Phosphor. 4,512,911, Cl. 252-301.40H.

Koubek, Edward, to American Sterilizer Company. Hydrogen peroxide liquid film sterilization method. 4,512,951, Cl. 422-33.000.

Kouge, Shinichi: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,513,239, Cl. 322-99.000.

Kousaka, Michio: *See*—
Kobayashi, Hiroshi; and Kousaka, Michio, 4,512,486, Cl. 215-249.000.

Kovach, Alan J.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,513,439, Cl. 382-7.000.

Kovach, Stephen M.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.

Kowalski, Ronald C.; Davis, William M.; Newman, Neil F.; and Erwin, Lewis, to Exxon Research and Engineering Co. Process for the manufacture of halogenated polymers. 4,513,116, Cl. 525-53.000.

Kozam, George; and Romanelli, Pat. Patient employed digital operated syringe device for irrigating periodontal pockets and other soft tissue spaces. 4,512,769, Cl. 604-209.000.

Kozar, Robert S., to AMSTED Industries Incorporated. Solvent addition to deep bed filter. 4,512,901, Cl. 210-792.000.

Kraco Enterprises: *See*—
van Kreuningen, Rudolf, 4,513,335, Cl. 360-94.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, 4,512,939, Cl. 264-0.500.
Losel, Georg; and Schneider, Egon, 4,512,785, Cl. 55-204.000.
Niemann, Hans-Joachim; and Sprehe, Josef, 4,512,957, Cl. 423-3.000.
Steinberg, Eckard, 4,512,819, Cl. 148-11.50F.

Krauchick, Walter. Radiator cap removing device. 4,512,215, Cl. 81-3.440.

Krauss-Maffei Aktiengesellschaft: *See*—
Eichlseder, Martin; and Burkle, Erwin, 4,512,733, Cl. 425-207.000.
Molzer, Peter; Pollner, Jurgen; Topic, Nicola; Trummer, Gregor; and Zurek, Rudolf, 4,512,560, Cl. 269-20.000.

Krejza, Jurgen: *See*—
Bauer, Ewald; and Krejza, Jurgen, 4,512,495, Cl. 220-316.000.

Kretschmer, Frank F., to United States of America, Navy. P1 Polyphase code expander-compressor. 4,513,289, Cl. 343-17.2PC.

Kretschmer, Stephen L.: *See*—
Cline, Kevin W.; and Kretschmer, Stephen L., 4,512,665, Cl. 366-167.000.

Kreuer, Klaus-Dieter; Weppner, Werner; and Rabenau, Albrecht, to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V. Galvanic cell comprising solid proton conductor as electrolyte. 4,513,069, Cl. 429-192.000.

Kridl, Thomas A.; and Claunch, Carney P., II, to Raychem Corporation. Aluminum-shielded coaxial cable repair. 4,512,833, Cl. 156-94.000.

Kriechbaum, Kurt: *See*—
Hartmannsgruber, Max; Kriechbaum, Kurt; Schulz, Gunter; and Guttler, Hermann, 4,512,061, Cl. 19-239.000.

Krishna, Surinder: *See*—
Ramde, Amolak R.; Khadder, Wadie N.; and Krishna, Surinder, 4,512,816, Cl. 148-1.500.

Krojidlo, Milan: *See*—
Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, 4,512,923, Cl. 260-112.5LH.

Krones AG Herman Kronseder Maschinenfabrik: *See*—
Schneider, Egon, 4,512,842, Cl. 156-357.000.

Krubur, Inc.: *See*—
Burke, James W.; Krueger, John D.; and Krueger, John W., 4,512,587, Cl. 277-205.000.

Krueger, John D.: *See*—
Burke, James W.; Krueger, John D.; and Krueger, John W., 4,512,587, Cl. 277-205.000.

Krueger, John W.: *See*—
Burke, James W.; Krueger, John D.; and Krueger, John W., 4,512,587, Cl. 277-205.000.

Kubach, Hans: *See*—
Gast, Theodor; Kubach, Hans; and Binder, Kurt, 4,512,549, Cl. 251-137.000.

Kubo, Keishi; and Kawamura, Eiichi, to Ricoh Co., Ltd. Heat-sensitive recording material. 4,513,052, Cl. 428-219.000.

Kubota Ltd.: *See*—
Hirata, Mitsuki; Sato, Yoshitaka; and Matudaira, Kaname, 4,512,413, Cl. 172-74.000.

Kubota, Norio: *See*—
Tone, Syoiti; and Kubota, Norio, 4,512,526, Cl. 242-36.000.

Kubota, Shikibu; and Tsuji, Shisaku, to Nissan Motor Company, Limited. Safety system of automotive automatic transmission operating device. 4,513,276, Cl. 340-52.00R.

Kudelski, Stefan, to Ampex Corporation. Reel servo for tape transport. 4,513,229, Cl. 318-7.000.

Kudert, Frederick G.; Tennant, William A.; and Tung, Thomas T., to American Can Company. Polymer flow stream redirecting and feeding device. 4,512,730, Cl. 425-130.000.

Kuhle, Engelbert; Klauke, Erich; Paulus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. Process for protecting wood using N-(dichlorofluoromethylthio)-3,6-endomethylene-Δ^4-tetrahydrophthalimide. 4,513,003, Cl. 514-411.000.

Kuhlthau, Hans-Peter: *See*—
Raue, Roderich; Huhne, Volker; and Kuhlthau, Hans-Peter, 4,513,142, Cl. 548-507.000.

Kuhn, John B.; and Lange, Henry J., to Deere & Company. Rotary tiller. 4,512,414, Cl. 172-112.000.

Kuhn, Klaus G. Device for exchanging a winding mandrel. 4,512,528, Cl. 242-56.00R.

Kukes, Simon G.; and Banks, Robert L., to Phillips Petroleum Company. Olefin metathesis and catalyst. 4,513,099, Cl. 502-228.000.

Kull, Peter: *See*—
Schaad, Walter; and Kull, Peter, 4,513,187, Cl. 200-144.0AP.

Kumano, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard device having cushioned weight member for electronic musical instrument. 4,512,234, Cl. 84-433.000.

Kumar, Vijay, to AMP Incorporated. Grounding mating hardware. 4,512,618, Cl. 339-14.00R.

Kummer, Peter; and Rehfeld, Gerhard, to Dynamit Nobel AG. Superrefractory dry ramming material based on zirconium oxide for the lining of induction-type crucible furnaces. 4,513,089, Cl. 501-103.000.

Kunesch, Anthony M.: *See*—
Jones, Bryan E.; and Kunesch, Anthony M., 4,512,938, Cl. 261-112.000.

Kuno, Toshitaka; Moribe, Hiroshi; and Miyamoto, Shojirou, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Control circuit of pulse width modulation inverter. 4,513,231, Cl. 318-341.000.

Kunugi, Katsuo; Suzuki, Togi; Konishi, Tadashi; and Ohwaki, Shinji, to Teijin Limited. Polyester composition. 4,513,114, Cl. 524-706.000.

Kunz, Barbara L.: *See*—
Abbey, Kirk J.; Erickson, James R.; and Kunz, Barbara L., 4,512,860, Cl. 204-181.00C.

Kuo, Han C.; Foster, Donald L.; Schlaikjer, Carl R.; Gopikanth, Mysore L.; and Dey, Arabinda N., to Duracell Inc. Inorganic non-aqueous cell. 4,513,067, Cl. 429-101.000.

Kurata, Izumi: *See*—
Ito, Tokuhisa; Ohno, Hideaki; Kurata, Izumi; and Okuyama, Takashi, 4,512,642, Cl. 354-4.000.

Kureha Chemical Industry Co., Ltd.: *See*—
Schmidt-Ruppin, Karl H., 4,512,972, Cl. 424-89.000.

Kurihara, Takenori; Tojo, Shigeki; and Hirakoso, Yohei, to Takeda Riken Co., Ltd. Swept frequency signal generator. 4,513,256, Cl. 331-4.000.

Kurt, Ewald H., to Ingersoll-Rand Company. Hydraulic reciprocating device. 4,512,417, Cl. 173-77.000.

Kurtz, Bruce E., to Allied Corporation. Process for consecutive competitive gas phase reaction. 4,513,154, Cl. 570-145.000.

Kurz, Craven H. Plastic shield for orthodontic appliance. 4,512,740, Cl. 433-22.000.

Kussy, Frank W.: *See*—
McClellan, David P.; and Kussy, Frank W., 4,513,267, Cl. 335-16.000.

Kusuki, Yoshihiro: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,512,893, Cl. 210-500.200.

Kuzma, Gregory S., to Wm. Steinen Mfg. Co. Compact long-life bypass and pressure unloader valve. 4,512,358, Cl. 137-116.000.

Kyburz, Emilio: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,513,002, Cl. 514-408.000.

Kyle, James C. Hermetically sealed insulating assembly. 4,512,791, Cl. 65-21.100.

Kyoto Central Co. Ltd.: *See*—
Nagase, Ushiro, 4,512,156, Cl. 60-641.200.

La Gard, Inc.: *See*—
Uyeda, Tim M., 4,512,165, Cl. 70-32.000.

La Telemecanique Electrique: *See*—
Belbel, Elie; Blanchard, Christian; Lauraire, Michel; Fechant, Louis; and Haury, Andre , 4,513,270, Cl. 335-195.000.

Labadini, William M.; and Scholz, John A., to GTE Products Corporation. High intensity discharge (HID) lamp starting apparatus. 4,513,227, Cl. 315-290.000.

La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., to Aluminum Company of America. Apparatus for processing recyclable containers. 4,512,253, Cl. 100-53.000.

Labofina, S.A.: *See*—
Lepain, Andre; and Bronchart, Robert D. E. M., 4,512,914, Cl. 252-355.000.

Laboratoire Roger Bellon: *See*—
Joannic, Michel; Roquet, Francoise; and Pesson, Marcel, 4,513,001, Cl. 514-394.000.

Laboratoires OM SA: *See*—
de Courten, Alfred; Schulthess, Adrian; and Esteve-Soler, Jose , 4,513,007, Cl. 514-555.000.

Lacefield, William B.: *See*—
Wong, David T.; and Lacefield, William B., 4,513,135, Cl. 544-120.000.

Lagana , Vincenzo: *See*—
Fattore, Vittorio; Notari, Bruno; Paggini, Alberto; and Lagana , Vincenzo, 4,513,100, Cl. 502-303.000.

Lagerstedt, Jan: *See*—
Hilmersson, Anders; Lagerstedt, Jan; and Andersson, Helge, 4,512,935, Cl. 261-79.00A.

Laing, Gordon E.; Harbeck, Martin E.; Jones, John E.; Sumerau, William R.; and Glenn, William K., III, to Singer Company, The. Floor care appliance. 4,512,057, Cl. 15-320.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Hay, Leon, 4,512,779, Cl. 55-26.000.

L'Air Liquide, Societe Anonyme pour l'Etude l'Exploitation des Procedes Georges Claude: *See*—
Simonet, Guy; and Hay, Leon, 4,512,778, Cl. 55-26.000.

Lamb, James S.; and Wimmer, Warren K., to Tektronix, Inc. Automatic processor restart circuit. 4,513,417, Cl. 371-12.000.

Lamb, Robert M. Apparatus for harvesting maple tree sap. 4,512,104, Cl. 47-52.000.

Lambert, Robert W.: *See*—
Attwood, Michael R.; Hassall, Cedric H.; Lambert, Robert W.; Lawton, Geoffrey; and Redshaw, Sally, 4,512,924, Cl. 260-243.300.

Landers, Jerry L., to SerVend International, Inc. Ice dispensing method and apparatus. 4,512,502, Cl. 222-413.000.

Landry, Walter J.; and Andre, Robert T. Scroll-type gatherer and top shredder with longitudinal blades for sugar cane harvester. 4,512,142, Cl. 56-13.900.

Landwehr, Gunter, to Kochs Adler AG. Sewing machine reversible feeding mechanism. 4,512,272, Cl. 112-311.000.

Lange, Fredric A., to Interlock Structures International, Inc. Modular proscenium theatre. 4,512,117, Cl. 52-6.000.

Lange, Henry J.: *See*—
Kuhn, John B.; and Lange, Henry J., 4,512,414, Cl. 172-112.000.

Langevin; Robert Z.: *See*—
Rehklau, George D.; Cotterill, Lee A.; and Langevin, Robert Z., 4,512,527, Cl. 242-56.00R.

Langley, Robert C. Titanium-lead anode for use in electrolytic processes employing sulfuric acid. 4,512,866, Cl. 204-290.00F.

Lankard, David R., to Ribbon Technology, Inc. Highly wear-resistant steel fiber reinforced concrete tiles. 4,513,040, Cl. 428-49.000.

Lanning, Frederick E., to International Business Machines Corporation. Depository apparatus with sequential stacking. 4,512,263, Cl. 109-66.000.

Lansing, Fikry L., to United States of America, National Aeronautics and Space Administration. Stable density stratification solar pond. 4,512,332, Cl. 126-415.000.

Laramore, Larry W. Plank-type building system. 4,512,131, Cl. 52-586.000.

Larkins, Bruce T., to DeSoto, Inc. Fireplace screen. 4,512,330, Cl. 126-139.000.

Larouche, Claude: *See*—
Dallaire, Remy; and Larouche, Claude, 4,512,582, Cl. 273-158.000.

Lau, Kei-Fung: *See*—
Yen, Kuo-Hsiung; Stokes, Robert B.; Lau, Kei-Fung; Kong, Alvin M.; and Kagiwada, Reynold S., 4,513,261, Cl. 333-194.000.

Laughon, Thomas C.: *See*—
Houser, John, Jr.; and Laughon, Thomas C., 4,513,381, Cl. 364-475.000.

Lauraire, Michel: *See*—
Belbel, Elie; Blanchard, Christian; Lauraire, Michel; Fechant, Louis; and Haury, Andre , 4,513,270, Cl. 335-195.000.

Lavash, Bruce W., to Procter & Gamble Company, The. Tissue paper product. 4,513,051, Cl. 428-212.000.

Lawson & Jones Limited: *See*—
Fleming, James W., 4,512,512, Cl. 229-30.000.

Lawton, Geoffrey: *See*—
Attwood, Michael R.; Hassall, Cedric H.; Lambert, Robert W.; Lawton, Geoffrey; and Redshaw, Sally, 4,512,924, Cl. 260-243.300.

Layton, Terry N.: *See*—
Cianci, James P.; and Layton, Terry N., 4,512,770, Cl. 604-323.000.

Leach, Jack; and Davis, Delbert A., to Burlington Industries, Inc. Sorbent internally ribbed carbon-containing material and protective garment fabricated therefrom. 4,513,047, Cl. 428-175.000.

LeBlond, Claude W., to Gerber Garment Technology, Inc. Method and apparatus for indexing sheet material. 4,512,079, Cl. 33-1.00M.

Lebo/Peerless Corp.: *See*—
Stravitz, David M., 4,512,468, Cl. 206-387.000.

Lecomte, Jeanne-Marie: *See*—
Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie, 4,513,009, Cl. 514-513.000.

Leder, Lewis B., to Xerox Corporation. Process for forming alloy layer. 4,513,031, Cl. 427-250.000.

Leder, Uri: *See*—
Westly, Pernie E.; and Leder, Uri, 4,512,505, Cl. 226-101.000.

Ledin, Walter L. Device for joining electronic transmission wire to electronic connectors. 4,512,507, Cl. 228-57.000.

Ledvina, Timothy J.: *See*—
Cole, Edward H., Jr.; and Ledvina, Timothy J., 4,512,754, Cl. 474-245.000.

Lee, Cheol H.: *See*—
Kim, Wan J.; Lee, Cheol H.; and Lee, Moon H., 4,513,134, Cl. 544-16.000.

Lee, Francis C.; Mills, Ross N.; Payne, Robert N.; and Talke, Frank E., to International Business Machines Corporation. Spot size modulation using multiple pulse resonance drop ejection. 4,513,299, Cl. 346-140.00R.

Lee, Gim F., Jr.: *See*—
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Lee, John D.: *See*—
Lee, Richard J.; and Lee, John D., 4,512,235, Cl. 86-23.000.

Lee, Minyoung: *See*—
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,512,946, Cl. 264-332.000.

Lee, Moon H.: *See*—
Kim, Wan J.; Lee, Cheol H.; and Lee, Moon H., 4,513,134, Cl. 544-16.000.

Lee, Richard J.; and Lee, John D. Stress limited cartridge reloading press. 4,512,235, Cl. 86-23.000.

Lee, Roy, Jr. Pipe conveying apparatus. 4,512,280, Cl. 118-426.000.

Lee, Seok-Ho: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lee, Seok-Ho, 4,512,925, Cl. 260-397.200.

Lefevre, Donald K.; Dennis, Patrick W.; and Seegmiller, Dennis F., to Sperry Corporation. Non-resonant coaxial monopole antenna. 4,513,290, Cl. 343-745.000.

Leftault, Charles J., Jr.: *See*—
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.

le Henand, Claude. Measuring and recording apparatus. 4,513,244, Cl. 324-51.000.

Leibinger, Karl, to Karl Liebinger Medizintechnik GmbH & Co. Sterilizable container. 4,512,498, Cl. 220-371.000.

Leibowitz, Joseph D., to TRW Inc. Controlled thermal expansion composite and printed circuit board embodying same. 4,513,055, Cl. 428-245.000.

Leidy, Grace: *See*—
Hodes, David S.; Leidy, Grace; Sprunt, Katherine; and Weldy, Piper, 4,513,083, Cl. 435-68.000.

Leininger, Glenn; and Spector, George. Snow plow scoop. 4,512,091, Cl. 37-278.000.

Leininger, Joel C., to International Business Machines Corporation. Latch circuits with differential cascode current switch logic. 4,513,283, Cl. 340-825.020.

Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., to Boliden Aktiebolag. Method for producing lead from sulphidic and oxidic and/or sulphatic lead raw materials. 4,512,798, Cl. 75-3.000.

Leitermann, Wulf: *See*—
Mahler, Gert; Falkenroth, Heinz-Jurgen; Leitermann, Wulf; and Boms, Manfred, 4,512,240, Cl. 98-2.040.

Leland Stanford Junion University, The Board of Trustees of The: *See*—
Levy, Ronald; Maloney, David G.; and Thielemans, Kristiaan, 4,513,088, Cl. 436-518.000.

Lemme, Charles D., to Blazer International Corp. Lamp comprising automatically actuated louver system. 4,513,358, Cl. 362-276.000.

Lemmers, Alfred E.; and Hammer, Edward E., to General Electric Company. Fluorescent lamp series system. 4,513,225, Cl. 315-189.000.

Lemole, Gerald M. Sternal closure method and means. 4,512,346, Cl. 128-335.000.

Lepain, Andre; and Bronchart, Robert D. E. M., to Labofina, S.A. Compositions and method for treating oil slicks. 4,512,914, Cl. 252-355.000.

Lepisto, J. George: *See*—
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Lepley, James W., to Flying Dutchman, Inc. Bottom silo unloader. 4,512,703, Cl. 414-288.000.

L'Equipement et la Construction Electrique en abrege E.C.E.: *See*—
Jullien, Gerard M. R., 4,513,275, Cl. 337-66.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 4(Or 5)-(pyridinyl)-2-pyrimidinamines and cardiotonic use thereof. 4,512,993, Cl. 514-275.000.

Leslie, Samuel A., to General Electric Company. Control circuit for a radio transceiver. 4,513,446, Cl. 455-73.000.

Lester, Victor E. Nebulizer with capillary feed. 4,512,341, Cl. 128-200.210.

Leveque de Vilmorin, Laurent. Golf club for instruction or recreation. 4,512,583, Cl. 273-168.000.
Lever Brothers Company: *See*—
Moran, David P. J.; and Sharp, David G., 4,513,017, Cl. 426-603.000.
Leveskis, Newton G. Methods for cryopreservation and transfer of bovine embryos. 4,512,337, Cl. 128-1.00R.
Levi, David E., to Maytag Company, The. Oven seal arrangement. 4,512,331, Cl. 126-190.000.
LeVine, Arthur L. Knife sharpener clamp construction. 4,512,112, Cl. 51-221.0BS.
Levine, Paula B., to Paula Blaine International, Ltd. Hidden message puzzle packet. 4,512,581, Cl. 273-153.00R.
Levy, Ronald; Maloney, David G.; and Thielemans, Kristiaan, to Leland Stanford Junion University, The Board of Trustees of The. Assay for monoclonal antibody against surface Ig of a human B cell tumor. 4,513,088, Cl. 436-518.000.
Lew, Hyok S.; and Lew, Yon S. Floating disc divert valve. 4,512,372, Cl. 137-862.000.
Lew, Yon S.: *See*—
Lew, Hyok S.; and Lew, Yon S., 4,512,372, Cl. 137-862.000.
Lewis, David F., to GAF Corporation. Electron beam sensitive resist. 4,513,076, Cl. 430-270.000.
Lewis, Jeffrey M. O., to University of Edinburgh, The University Court of the. Self-acting fluid non-return valve. 4,512,366, Cl. 137-527.800.
Lewis, John W.: *See*—
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LGZ Landis & Gyr Zug AG: *See*—
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Licentia Patent-Verwaltungs-GmbH: *See*—
Dulken, Hartmut; Kassel, Karlheinz; Mows, Wolfgang; and Walsdorfer, Hubert, 4,513,072, Cl. 430-57.000.
Schroder, Ernst F., 4,513,253, Cl. 330-278.000.
Liddell, Olin E. Method of and apparatus for telling time at night. 4,512,085, Cl. 33-269.000.
Lieberman, David M. Method of offsetting postoperative astigmatism with an intraocular lens. 4,512,039, Cl. 3-13.000.
Lieberman, Steven. Picture hanging marker. 4,512,084, Cl. 33-180.00R.
Liebert, Reuel B.; and Russo, Carl J., to Varian Associates, Inc. Method for reducing phosphorous contamination in a vacuum processing chamber. 4,512,812, Cl. 134-21.000.
Lietzke, G. W., to Container Corporation of America. Display stand. 4,512,541, Cl. 248-459.000.
Light, David R.: *See*—
Dennis, Mark S.; Estell, David A.; and Light, David R., 4,512,973, Cl. 424-94.000.
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Ligman, James R.: *See*—
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Lignes Telegraphiques & Telephoniques: *See*—
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Lilly Industries Limited: *See*—
Baker, Stephen R.; Jamieson, William B.; Ross, William J.; and Todd, Alec, 4,513,005, Cl. 514-451.000.
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Linde Aktiengesellschaft: *See*—
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Linde, Rolf: *See*—
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Linder, Ernst: *See*—
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Linder, Karen E., to Du Pont de Nemours, E. I., and Company. Cationic technetium complexes useful as radiodiagnostic agents. 4,512,967, Cl. 424-1.100.
Lindsay, Erin J.: *See*—
Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., 4,512,163, Cl. 62-394.000.
Ling, Bernt; and Sternad, Mikael, to ASEA Aktiebolag. Unloading of goods, such as bulk goods from a driven, suspended load-carrier. 4,512,711, Cl. 414-786.000.
Linnemeier, Elmer H., to Torrington Company, The. Steering column. 4,512,209, Cl. 74-492.000.
Lion Corporation: *See*—
Komiyama, Noboru; Itoi, Hiroshi; and Sano, Hiroshi, 4,512,968, Cl. 424-48.000.
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,512,404, Cl. 166-274.000.
Lipha, Lyonnaise Industrielle Pharmaceutique: *See*—
Bayssat, Michel; Belleville, Maryse; and Grand, Marcel, 4,512,994, Cl. 514-374.000.
Lipinski, Reinhard; and Neff, Karl, to PROMA Produkt-und Marketing Gesellschaft m.b.H. Mechanical rotary-to-linear motion conversion element. 4,512,208, Cl. 74-89.150.
Little, Thomas R.: *See*—
Farag, Samir F.; Allen, Edgar W.; and Little, Thomas R., 4,513,180, Cl. 200-50.00R.
Liu, Ping Y., to General Electric Company. Polycarbonate resin mixtures. 4,513,119, Cl. 525-92.000.
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Location Sample Service, Inc.: *See*—
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Logan, Max C.; and Nordstrom, Jon T., to Control Data Corporation. Dew point sensitive computer cooling system. 4,512,161, Cl. 62-176.600.
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Loitzl, Ruzica: *See*—
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Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., to Union Carbide Corporation. Cracking of crude oils with carbon-hydrogen fragmentation compounds over non-zeolitic catalysts. 4,512,875, Cl. 208-114.000.
Long, Stanley E. Animal and insect exterminator. 4,512,102, Cl. 43-84.000.
Loper, Bernd, to Daimler-Benz A.G. Wheel cover with retainment system. 4,512,614, Cl. 301-37.00P.
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Losel, Georg; and Schneider, Egon, to Kraftwerk Union Aktiengesellschaft. Apparatus for drying steam in steam power generating stations. 4,512,785, Cl. 55-204.000.
Loubier, Robert J.; and Muhn, Robert A. Dental floss applicator with improved floss severing and anchoring. 4,512,354, Cl. 132-91.000.
Louttit, Duncan R., to U.S. Philips Corporation. Radio receiver suitable for use in a spaced carrier area coverage system. 4,513,443, Cl. 455-52.000.
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Luccarelli, Domenick, Jr.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,512,919, Cl. 252-522.00R.
Luczak, Francis J., to United Technologies Corporation. Single-batch process to prepare noble metal vanadium alloy catalyst on a carbon based support. 4,513,094, Cl. 502-101.000.
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Lumaret, Jean-Claude; Gosset, Serge; and Huchette, Michel, to Roquette Freres. Composition and method of inhibiting corrosion by water of metal substrates. 4,512,915, Cl. 252-389.00A.
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Lund, William J., to Spear Harvesters. Asparagus harvester. 4,512,145, Cl. 56-327.00A.
Lundberg, Robert D., to Exxon Research and Engineering Co. Ionic polymer-polylactone compositions as flow improvers for oils and fuels. 4,512,776, Cl. 44-62.000.
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Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,512,798, Cl. 75-3.000.

Lundy, Joseph R., to Lundy Research Laboratories, Inc. Therapeutic selenium compositions and the use thereof. 4,512,977, Cl. 424-132.000.
Lundy Research Laboratories, Inc.: *See—*
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Maddock, Robert F., to International Business Machines Corporation. Text processing apparatus with two-stage formatting of text. 4,513,391, Cl. 364-900.000.
Maeda, Kouzo; and Tsujimura, Harutoshi, to Nissan Motor Company, Limited. Vehicular seat arrangement. 4,512,604, Cl. 296-65.00A.
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Magnetfabrik Bonn GmbH, vorm. Gewerkschaft Windhorst: *See—*
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Maignan, Jean; and Shroot, Braham, to Societe Ancnyme dite: L'Oreal. N-carbamoyl derivatives of (5,4b)-isothiazolo pyridine-3-one and anti-acne cosmetic compositions containing the same. 4,512,985, Cl. 514-301.000.
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Manzoni, Stephane, to Manzoni-Bouchot. Vehicle rearview mirror remote-control device. 4,512,633, Cl. 350-632.000.
Mar, Bob. Locking screw cap. 4,512,484, Cl. 215-221.000.
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Marathon Oil Company: *See—*
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Seely, James R., 4,512,095, Cl. 40-156.000.
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Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, to Roussel Uclaf. Process for preparing cis-3-(2,2-dihalovinyl)-2,2-dimethylcyclopropanecarboxylic acid. 4,513,147, Cl. 562-506.000.
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Masaki, Satoru, to Fujitsu Limited. Circuit for reading out address data applied to a memory in a one-chip microcomputer. 4,513,400, Cl. 365-230.000.
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Mastromatteo, Michael. Methods of welding. 4,513,194, Cl. 219-121.0EC.
Mathew, Ronald G. Gun locking device. 4,512,099, Cl. 42-1.0LP.
Mathews, Bernard C., deceased; and by Mathews, Violet E., administrator. Drum mowers having spring mounted flat blades. 4,512,141, Cl. 56-13.600.
Mathews, J. Paul. Device for filtering stack gases. 4,512,787, Cl. 55-284.000.
Mathews, Violet E., administrator: *See*—
Mathews, Bernard C., deceased; and Mathews, Violet E., administrator, 4,512,141, Cl. 56-13.600.
Matoba, Tamiji: *See*—
Shino, Kunihiko; and Matoba, Tamiji, 4,512,983, Cl. 424-195.100.
Matseas, William G.: *See*—
Herdeg, Donald F.; and Matseas, William G., 4,512,271, Cl. 112-158.00E.
Matsuda, Naotoshi; Tetsuishi, Yoshinori; and Higuchi, Kazuaki, to Kabushiki Kaisha Toshiba. White luminescent phosphor for use in cathode ray tube. 4,512,912, Cl. 252-301.60S.
Matsui, Kazuhiro, to Kitagawa Industries Co., Ltd. Clamp fixing device. 4,513,172, Cl. 174-65.0SS.
Matsui, Kazuma: *See*—
Nakano, Hiromichi; Sasaya, Hideaki; Inagaki, Mitsuo; Matsui, Kazuma; and Yoshimura, Kunimasa, 4,512,728, Cl. 418-3.000.
Matsui, Toshiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Crystal growing apparatus. 4,512,954, Cl. 422-106.000.
Matsui, Yoshiya: *See*—
Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, 4,512,641, Cl. 350-573.000.
Matsukata, Kosuke. High speed underground transportation system. 4,512,258, Cl. 104-138.00R.
Matsumoto, Hajime; and Abe, Yoichi, to Toybox Corporation. Mechanical pendant. 4,512,748, Cl. 446-354.000.
Matsumoto, Hiroshi; and Nawata, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Sorter. 4,512,565, Cl. 271-294.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Takeuchi, Hiroshi; and Maruno, Yoshiaki, 4,512,435, Cl. 181-170.000.
Tanabe, Kenzo; and Suzuki, Junji, 4,513,209, Cl. 307-350.000.
Ueda, Shigeki; and Takano, Teruhisa, 4,513,189, Cl. 219-10.55B.
Matsushita Electric Works, Ltd.: *See*—
Ishigami, Yoshihisa; Hashimota, Yasumasa; Kitado, Tadaharu; Nishimura, Hiromi; and Mori, Tetsuo, 4,513,339, Cl. 361-45.000.
Tanabe, Toshio; and Kita, Masakazu, 4,512,077, Cl. 30-43.000.
Matsushita, Takao: *See*—
Takayama, Yukio; Noguchi, Akio; and Matsushita, Takao, 4,513,301, Cl. 346-200.000.
Matsuura, Kazumi; and Wada, Takeo, to Takeda Chemical Industries, Ltd. Hormite inclusion complex with adsorbed sulphur or sulphur donor. 4,512,962, Cl. 423-331.000.
Matthews, John A.: *See*—
Striebel, Edmund E.; Matthews, John A.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,512,158, Cl. 60-740.000.
Matudaira, Kaname: *See*—
Hirata, Mitsuki; Sato, Yoshitaka; and Matudaira, Kaname, 4,512,413, Cl. 172-74.000.
Matviak, John. Device for reducing predictability in card games. 4,512,580, Cl. 273-148.00A.
Mauldin, Charles H., to Exxon Research and Engineering Co. Conversion of methanol to hydrocarbons. 4,513,161, Cl. 585-640.000.
Maurer, Fritz; Homeyer, Bernhard; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Insecticidal N-substituted O-pyrazol-4-yl carbamates and use thereof. 4,513,000, Cl. 514-407.000.
Maurin, Maurice: *See*—
Carette, Brigitte; Kone, Ali; Souquet, Jean-Louis; Ribes, Michel; and Maurin, Maurice, 4,513,070, Cl. 429-193.000.
Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V.: *See*—
Kreuer, Klaus-Dieter; Weppner, Werner; and Rabenau, Albrecht, 4,513,069, Cl. 429-192.000.
Max Planck Gesellschaft Zur Forderung der Wissenschaften: *See*—
Wissler, Josef H., 4,512,970, Cl. 424-85.000.
Wissler, Josef H., 4,512,971, Cl. 424-85.000.
Maytag Company, The: *See*—
Levi, David E., 4,512,331, Cl. 126-190.000.
Mazda Motor Corporation: *See*—
Sakurai, Shigeru; and Hamada, Shigeki, 4,512,786, Cl. 55-282.000.
Tsuchida, Tsuyoshi; Kido, Yoshinobu; Kakumoto, Hideki; and Tanaka, Yuzuru, 4,512,313, Cl. 123-440.000.
Mazur, Stephen, to Du Pont de Nemours, E. I., and Company. Deposition of metals as interlayers within organic polymeric films. 4,512,855, Cl. 204-22.000.
McAnney, William H.: *See*—
Bardell, Paul H., Jr.; and McAnney, William H., 4,513,418, Cl. 371-25.000.
McClellan, David P.; and Kussy, Frank W., to Siemens-Allis, Inc. Stationary contact strap to achieve a current limiting blow-off effect. 4,513,267, Cl. 335-16.000.
McClure, Hubert L. Bifocal intraocular lens. 4,512,040, Cl. 3-13.000.
McClure, Robert B.: *See*—
Cunningham, George F., Jr.; Lewis, John W.; McClure, Robert B.; and Poindexter, Daniel J., 4,512,841, Cl. 156-345.000.
McConnell, Forrest M., to Koos, Inc. Ice melter and method of making same. 4,512,907, Cl. 252-70.000.
McCullough, John E., to Arthur D. Little, Inc. Method of fabricating scroll members. 4,512,066, Cl. 29-23.500.
McDonnell Douglas Corporation: *See*—
Tucci, Allan T., 4,512,836, Cl. 156-174.000.
McFarland, Cecil G., to Petro-Tex Chemical Corporation. Acetylene removal process. 4,513,159, Cl. 585-625.000.
McGehee, R. Stephen, to Gof Manufacturing Company, Inc. Apparatus and method for egg turning during incubation. 4,512,285, Cl. 119-44.000.
McGilvray, Bruce L.: *See*—
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., 4,513,367, Cl. 364-200.000.
McGrane, Eugene W., to Homac Mfg. Company. Transformer bar connector cover. 4,513,169, Cl. 174-138.00F.
McGraw-Edison Company: *See*—
Martinez, Louis, 4,513,415, Cl. 370-92.000.
McLaughlin, Thomas F.; and Diaz, Gerard J., to Technical Support Services, Inc. Replacement labels for keyboard. 4,512,092, Cl. 40-2.00R.
McMaster, Ronald A., to Glasstech, Inc. Glass sheet roller conveyor including antifriction drive chain. 4,512,460, Cl. 198-790.000.
McMillin Wire and Plating, Inc.: *See*—
Stroh, Alvin L., 4,512,540, Cl. 248-95.000.
McNeil Lab., Inc.: *See*—
Maryanoff, Bruce E.; and Gardocki, Joseph F., 4,513,006, Cl. 514-23.000.
McNeilab, Inc.: *See*—
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McQuay, Inc.: *See*—
Tsou, John L., 4,512,496, Cl. 220-319.000.
McShirley Products, Inc.: *See*—
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McShirley, Robert C., to McShirley Products, Inc. Percussor application. 4,512,339, Cl. 128-41.000.
Mead Corporation, The: *See*—
Fields, Willie M., 4,512,756, Cl. 493-312.000.
Scott, Dale K.; and Calvert, Rodney K., 4,512,135, Cl. 53-285.000.
Mechel, Adam: *See*—
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Medar, Inc.: *See*—
Farrow, John F., 4,513,363, Cl. 363-126.000.
Medbury, Seward J. Means for the sorption of a petroleum product from a liquid. 4,512,890, Cl. 210-335.000.
Medical Research (Marketing) Pty, Ltd.: *See*—
Corbett, Lorimer J., 4,513,010, Cl. 514-651.000.
Meglino, Don A. Slat retaining means for chain link fences. 4,512,556, Cl. 256-34.000.
Mehrotra, Deepak; Shaw, Gerard J.; Go, Jok Y.; and Kant, Rajni, to Raytheon Company. Semiconductor device fabrication process. 4,512,076, Cl. 29-578.000.
Meier, Jean; and Clemence, Francois, to Roussel Uclaf. 4,5-Bis(aryl)-4H-1,2,4-triazole derivatives and analgesic use. 4,512,997, Cl. 514-383.000.
Meier, Linus, to Mettler Instruments AG. Weighing apparatus for producing geographically-corrected measurements. 4,512,429, Cl. 177-25.000.
Melaika, Edward A.: *See*—
Anstine, Larry D.; James, Dean B.; Melaika, Edward A.; and Peterson, John P., Jr., 4,512,921, Cl. 252-626.000.
Melde, Chris R. Dental mirror apparatus. 4,512,635, Cl. 350-640.000.
Memmen, Robert L., to United Technologies Corporation. Clip attachment. 4,512,159, Cl. 60-752.000.
Mentzel, Lee R. Smoker adapter for kettle grills. 4,512,249, Cl. 99-352.000.
Mentzer, William R., to Kidde, Inc. Multiple offset crane boom extension. 4,512,482, Cl. 212-188.000.
Merck & Co., Inc.: *See*—
Johnston, David B. R., 4,512,991, Cl. 514-252.000.
Patchett, Arthur A.; and Wu, Mu T., 4,512,979, Cl. 514-2.000.
Sparer, Randall V.; and Bhaskar, Ravi K., 4,513,034, Cl. 428-1.000.
Merritt, Lauren V.; and Maclay, William R., to Datacopy Corporation. Disk drive having fine and coarse control of the read/write head. 4,513,332, Cl. 360-77.000.
Merry, Richard P., to Minnesota Mining and Manufacturing Company. Intumescent fire protective sheaths. 4,513,173, Cl. 174-121.00A.
Messerly, James W.: *See*—
Babbin, William R.; and Messerly, James W., 4,512,942, Cl. 264-26.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Sarh, Branko; and Pasenau, Hartmut, 4,512,837, Cl. 156-189.000.
Metaframe, Inc.: *See*—
Horvath, Tibor, 4,512,724, Cl. 417-319.000.
Metal Box plc: *See*—
Abbott, James B.; Kohn, Ernest O.; Berry, Christopher; and Slade, Mark N., 4,512,172, Cl. 72-68.000.
Metronic Electronic GmbH: *See*—
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Mettler Instruments AG: *See*—
Meier, Linus, 4,512,429, Cl. 177-25.000.
Meulners, Duane C.: *See*—
Young, Ronald E.; and Meulners, Duane C., 4,513,333, Cl. 360-77.000.
Mey, William, to Eastman Kodak Company. Erasable information recording process using co-crystalline dye complexes. 4,513,071, Cl. 430-19.000.

Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Catalysis over activated high silica zeolites. 4,512,876, Cl. 208-114.000.
Miale, Joseph N.: *See—*
Chang, Clarence D.; and Miale, Joseph N., 4,513,091, Cl. 502-71.000.
Michaud, Roger. Furnace heat exchanger. 4,512,288, Cl. 122-20.00B.
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Michelbrink, Bernhard: *See—*
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Michnick, Bruce T.; and Kitzis, Stanley, to Dentistry Researchers & Designers, Inc. Method enabling rapid identification of humans and animals. 4,512,744, Cl. 433-229.000.
Microdot Inc.: *See—*
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Mikola, James A., to Ford Motor Company. Replaceable lamp assembly and locking mechanism for a sealable reflector housing. 4,513,356, Cl. 362-226.000.
Milewski, John V., to United States of America, Energy. Method of producing silicon carbide articles. 4,513,030, Cl. 427-227.000.
Miller, Francis M., to Conax Corporation. Fluid conductivity sensor. 4,513,248, Cl. 324-439.000.
Miller, Robert J., to United Technologies Corporation. Method for cylindrical grinding turbine engine rotor assemblies. 4,512,115, Cl. 51-289.00R.
Miller, Robert L.: *See—*
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Milliken Research Corporation: *See—*
Otto, Wolfgang K. F., 4,512,065, Cl. 26-28.000.
Millipore Corporation: *See—*
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Mills, Ross N.: *See—*
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Milsom, Robert F.: *See—*
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Goodnight, Lyman E., Jr., 4,512,899, Cl. 210-656.000.
Minami, Kazuaki: *See—*
Hasebe, Koshi; Miura, Kunio; Ono, Takashi; Akutsu, Kazushi; and Minami, Kazuaki, 4,513,377, Cl. 364-449.000.
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Watanabe, Toshimitu; Sakai, Masayuki; Minami, Kazutoshi; and Takumi, Shigeji, 4,512,239, Cl. 98-2.030.
Minami, Setsuo: *See—*
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Minamida, Kazukiyo, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus. 4,512,427, Cl. 177-1.000.
Mink, Paul K. Violin construction. 4,512,231, Cl. 84-277.000.
Minnesota Mining and Manufacturing Company: *See—*
Esmay, Donald L., 4,513,039, Cl. 428-40.000.
Fabbrini, Charles J., 4,513,107, Cl. 524-56.000.
Graham, Joseph, 4,512,806, Cl. 106-18.240.
Jeffrey, Frank R., III; and Shirck, James R., 4,513,073, Cl. 430-65.000.
Merry, Richard P., 4,513,173, Cl. 174-121.00A.
Reisem, Daniel E., 4,513,271, Cl. 335-205.000.
Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., 4,512,163, Cl. 62-394.000.
Minnis, Brian J., to U.S. Philips Corporation. Bandpass filters. 4,513,263, Cl. 333-204.000.
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Kitaura, Mashio; Ishikawa, Norio; and Ishimura, Toshihiko, 4,512,646, Cl. 354-409.000.
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Minoura, Kazuo: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Ishihara, Osamu, 4,513,266, Cl. 333-238.000.
Kishimoto, Syoji, 4,513,217, Cl. 310-227.000.
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Morishita, Mitsuharu; and Kouge, Shinichi, 4,513,239, Cl. 322-99.000.
Sakamoto, Toshiyuki; and Wataya, Seiji, 4,512,314, Cl. 123-459.000.
Tobita, Youichi, 4,513,399, Cl. 365-189.000.
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Usui, Masaji, 4,513,344, Cl. 361-113.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Hosoda, Naoyuki; Uchiyama, Naoki; and Kawanaka, Ryusuke, 4,512,950, Cl. 420-563.000.
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,512,557, Cl. 266-171.000.
Mitsubishi Plastics Industries Limited: *See—*
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Mitsubishi Rayon Co., Ltd.: *See—*
Kishida, Kazuo; Yamamoto, Naoki; Nishida, Kozi; Narita, Toshihito; and Sato, Yasumasa, 4,513,111, Cl. 524-458.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Tamura, Kunimitsu; and Hosonuma, Kunihiko, 4,513,155, Cl. 585-13.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Mizui, Kinya; Takeda, Masami; and Iwata, Tadao, 4,513,130, Cl. 526-283.000.
Yamasaki, Kazuyuki; and Kagawa, Fukashi, 4,513,049, Cl. 428-194.000.
Mitter, Mathias. Method of applying foamed dyeliquors to fibrous substrates or the like. 4,512,772, Cl. 8-477.000.
Miura, Ieaki, to Tokico Ltd. Hydraulic damper. 4,512,447, Cl. 188-322.150.
Miura, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Automatic plate thickness control device. 4,512,169, Cl. 72-16.000.
Miura, Kunio: *See—*
Hasebe, Koshi; Miura, Kunio; Ono, Takashi; Akutsu, Kazushi; and Minami, Kazuaki, 4,513,377, Cl. 364-449.000.
Miura, Norio: *See—*
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Miwa, Hirohide; and Ueda, Mitsuhiro, to Fujitsu Limited. Ultrasonic living body tissue characterization method. 4,512,195, Cl. 73-602.000.
Miyahara, Masahiko: *See—*
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Miyajima, Mikio: *See—*
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Miyamoto, Hidekazu; Shioya, Yoshimi; Maeda, Mamoru; and Takagi, Mikio, to Fujitsu Limited. Method for coating a semiconductor device with a phosphosilicate glass. 4,513,026, Cl. 427-85.000.
Miyamoto, Kiyoshi; and Ueda, Kenji, to Omron Tateisi Electronics Co. Proximity switch with oppositely polarized coils. 4,513,257, Cl. 331-65.000.
Miyamoto, Motomu. Interlocking contactor assembly. 4,513,269, Cl. 335-161.000.
Miyamoto, Shojirou: *See—*
Kuno, Toshitaka; Moribe, Hiroshi; and Miyamoto, Shojirou, 4,513,231, Cl. 318-341.000.
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, to Kabushiki Kaisha Yakult Honsha. Camptothecin-1-oxide derivatives. 4,513,138, Cl. 546-48.000.
Miyata, Takeshi: *See—*
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Miyazaki, Shu, to Sumitomo Metal Mining Company Limited. Manufacturing a carrier tape or tapes. 4,512,843, Cl. 156-644.000.
Mizokami, Kazunori, to Olympus Optical Co., Ltd. Program type automatic exposure controller for use in cameras. 4,512,648, Cl. 354-443.000.
Mizui, Kinya; Takeda, Masami; and Iwata, Tadao, to Mitsui Petrochemical Industries, Ltd. Hydrocarbon resin and modified hydrocarbon resin product thereof. 4,513,130, Cl. 526-283.000.
Mizukane, Masahiro: *See—*
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Mizuno, Toshiaki: *See—*
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Chang, Clarence D.; and Miale, Joseph N., 4,513,091, Cl. 502-71.000.
Chu, Pochen; and Dwyer, Francis G., 4,513,092, Cl. 502-71.000.
Chung, Harold S.; and Dickert, Joseph J., Jr., 4,512,872, Cl. 208-11.0LE.
Gilbert, Clark J.; Hassialis, Menelaos D.; Scrymgeour, Andrew H.; and Vera, Samuel I., 4,512,610, Cl. 299-13.000.
Herrington, F. John, Jr., 4,512,476, Cl. 206-554.000.
Lyman, Dale E.; and Anderson, James J., 4,512,932, Cl. 260-990.000.
Miale, Joseph N.; and Chang, Clarence D., 4,512,876, Cl. 208-114.000.
Ottsen, Henning; and Barker, Thruburn, 4,513,401, Cl. 367-19.000.
Tabak, Samuel A., 4,513,156, Cl. 585-329.000.

Tsao, Ying-Yen P., 4,513,098, Cl. 502-216.000.

Mochizuki, Kenji, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection system for an internal combustion engine. 4,512,316, Cl. 123-478.000.

Mochizuki, Noritaka; Minami, Setsuo; and Matsui, Yoshiya, to Canon Kabushiki Kaisha. Compound eye projection device. 4,512,641, Cl. 350-573.000.

Mohon, Windell N.; and Harris, William T., to United States of America, Navy. Flight simulator with dual probe multi-sensor simulation. 4,512,745, Cl. 434-43.000.

Mohr, James W., to Outboard Marine Corporation. Outboard motor with selectively operable drainage system. 4,512,294, Cl. 123-73.00R.

Moldawer, Lyle L.; Blackburn, George L.; and Bistrian, Bruce R. Treatment of protein malnourished surgical patients. 4,512,974, Cl. 424-101.000.

Moler, Ronald: *See—*
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Molex Incorporated: *See—*
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Moll, Richard J. Feeder table with photo-scan controlled belt motor. 4,512,562, Cl. 270-45.000.

Molzer, Peter; Pollner, Jurgen; Topic, Nicola; Trummer, Gregor; and Zurek, Rudolf, to Krauss-Maffei Aktiengesellschaft. Apparatus for mounting rails on a rigid rail beam. 4,512,560, Cl. 269-20.000.

Monahan, John F.: *See—*
Olson, Charles L.; and Monahan, John F., 4,513,321, Cl. 358-172.000.

Money, David K., to Electronics Pty. Ltd. Automatic P-well clamping for CMOS integrated circuit. 4,513,212, Cl. 307-575.000.

Monsanto Company: *See—*
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Montana Power Company, The: *See—*
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Monte, Salvatore J.: *See—*
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Mookherjee, Braja D.: *See—*
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Moore, Dwane L.: *See—*
Engelhardt, Billy M.; and Moore, Dwane L., 4,512,645, Cl. 354-324.000.

Moore, John T.; Corrigan, Peter E.; and Gardner, James A., to General Motors Corporation. Low fuel indicator system. 4,513,277, Cl. 340-59.000.

Moore, Leslie B., to Dresser Industries, Inc. Rock bit bearing pressure equalization system. 4,512,669, Cl. 384-93.000.

Moore, Lyman T.: *See—*
Karagoz, Berch Y.; Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,513,425, Cl. 373-88.000.

Moore, William H.; Mandel, Alan F.; Trosky, William J.; Eichler, Kenneth M.; Tomas, Stephen P.; Tober, Edward; and Vasold, Thomas A., to Westinghouse Electric Corp. Method and apparatus for improving the servicing of an elevator system. 4,512,442, Cl. 187-29.00R.

Moran, David P. J.; and Sharp, David G., to Lever Brothers Company. Process for producing a spread starting from a bimodal dispersed phase. 4,513,017, Cl. 426-603.000.

Mori, Kei. Solar energy collecting apparatus. 4,512,335, Cl. 126-440.000.

Mori, Masanobu: *See—*
Suzuki, Shunsuke; Mori, Masanobu; and Miyata, Takeshi, 4,512,383, Cl. 164-35.000.

Mori, Tetsuo: *See—*
Ishigami, Yoshihisa; Hashimota, Yasumasa; Kitado, Tadaharu; Nishimura, Hiromi; and Mori, Tetsuo, 4,513,339, Cl. 361-45.000.

Mori, Yasuhiko; Hattori, Shigeo; Masaoka, Isao; and Itow, Hisao, to Hitachi, Ltd. In-pile parts for nuclear reactor and method of heat treatment therefor. 4,512,820, Cl. 148-12.70N.

Moribe, Hiroshi: *See—*
Kuno, Toshitaka; Moribe, Hiroshi; and Miyamoto, Shojirou, 4,513,231, Cl. 318-341.000.

Moriguchi, Haruhiko: *See—*
Svay, Leng; Moriguchi, Haruhiko; and Inui, Toshiharu, 4,513,296, Cl. 346-76.0PH.

Morimoto, Yoshiro: *See—*
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,512,751, Cl. 474-28.000.

Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling a charging generator. 4,513,239, Cl. 322-99.000.

Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,512,404, Cl. 166-274.000.

Morita, Ken: *See—*
Ohyama, Hiroshi; Morita, Ken; Wada, Takuo; and Miyahara, Masahiko, 4,512,989, Cl. 514-383.000.

Morita, Yasukazu; and Watanabe, Naomitsu, to Hitachi, Ltd. Process for forming phosphor screen. 4,513,024, Cl. 427-65.000.

Morival, Anne: *See—*
Morival, Fernand; and Morival, Anne, 4,512,533, Cl. 242-129.000.

Morival, Fernand; and Morival, Anne. Process and apparatus for unwinding coils of wire. 4,512,533, Cl. 242-129.000.

Moriya, Michio: *See—*
Kita, Yasuo; Moriya, Michio; and Yoshida, Kenichi, 4,512,615, Cl. 303-97.000.

Morris, Earl L.; and Hafner, V. Walter, to Acorn Engineering Company. Plenum/vacuum chamber with duct connection for installation in cabinet of fixture to control air supply or return. 4,512,241, Cl. 98-32.000.

Mort, Joseph: *See—*
Jansen, Frank; and Mort, Joseph, 4,513,022, Cl. 427-39.000.

Morton Thickol, Inc.: *See—*
Schmidle, Claude J., 4,512,910, Cl. 252-188.310.

Mosebach, Wilhelm, to Ruhrkohle Aktiengesellschaft. Process for wet quenching of coal-coke. 4,512,850, Cl. 201-1.000.

Motomura, Jiro; Kamiya, Yasuhisa; and Nishikawa, Seiichi, to Aisin Warner Kabushiki Kaisha. Front cover for a torque converter and method of processing the same. 4,512,449, Cl. 192-3.280.

Motoren-un Turbinen-Union Munchen GmbH: *See—*
Rossmann, Axel, 4,512,719, Cl. 416-241.00B.

Motoren-und Turbinen-Union Munchen GmbH: *See—*
Hagemeister, Klaus, 4,512,069, Cl. 29-156.80B.

Motorola, Inc.: *See—*
Carson, Lansing M., 4,513,447, Cl. 455-76.000.
Davies, Robert B., 4,513,306, Cl. 357-36.000.
Field, Harold; and Richter, Robert E., 4,513,068, Cl. 429-121.000.
Hing, Sam A.; and Guillien, Michel, 4,513,178, Cl. 179-81.00R.
Jamiolkowski, Michael J.; and Campbell, Jules D., Jr., 4,513,258, Cl. 331-111.000.
Muri, David L., 4,513,385, Cl. 364-572.000.
Schroeder, Jack A.; and Winkler, Ernel R., 4,513,355, Cl. 361-403.000.
Vyne, Robert L., 4,513,251, Cl. 330-292.000.

Motter Printing Press Co.: *See—*
Reslow, Leif F.; Nieman, Mark D.; and Swagert, Dean R., 4,512,254, Cl. 101-157.000.

Mouton, Pierre C., to Societe Nationale d'Etude de Constudies de Mateurs d'Aviation. Device and process for monitoring cavitation in a positive displacement pump. 4,512,722, Cl. 417-63.000.

Mows, Wolfgang: *See—*
Dulken, Hartmut; Kassel, Karlheinz; Mows, Wolfgang; and Walsdorfer, Hubert, 4,513,072, Cl. 430-57.000.

Mozley, Robert M., to Continental Disc Corporation. Method for forming rupture disc. 4,512,171, Cl. 72-55.000.

Muad, Al-Madhi, to TMC Corporation. Holding mechanism, in particular for ski bindings. 4,512,698, Cl. 411-337.000.

Muhl, Reinhold: *See—*
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., 4,513,203, Cl. 250-491.100.

Muhn, Robert A.: *See—*
Loubier, Robert J.; and Muhn, Robert A., 4,512,354, Cl. 132-91.000.

Mulcahy, Joseph A., to J. Mulcahy Enterprises Incorporated. Vacuum treating steels. 4,512,799, Cl. 75-49.000.

Muller, Jens: *See—*
Kaube, Peter; Schanz, Karl-Heinz; Vetter, Heinz; and Muller, Jens, 4,513,048, Cl. 428-188.000.

Muller, Klaus: *See—*
Hutchings, Ron; Loitzl, Ruzica; and Muller, Klaus, 4,513,102, Cl. 502-325.000.

Muller, Werner, to Magnetfabrik Bonn GmbH, vorm. Gewerkschaft Windhorst. Multi-pole rotor particularly for small and miniature electric generators and motors. 4,513,216, Cl. 310-156.000.

Mumford, Eustace H.: *See—*
Irwin, George W.; and Mumford, Eustace H., 4,512,792, Cl. 65-161.000.

Munekata, Kenichi; Doi, Yoshio; Suzuki, Isao; and Doi, Shigeru, to Toyoda Koki Kabushiki Kaisha. Menu programmed machine tool numerical controller with an interference checking function. 4,513,366, Cl. 364-167.000.

Mungons, Edwin M. Alignment control device. 4,512,682, Cl. 403-390.000.

Murakami, Hiroyashu: *See—*
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, 4,512,656, Cl. 354-475.000.

Murakami, Hiroyasu: *See—*
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Muramatsu, Kiyohide: *See—*
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Murase, Takao: *See—*
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Murata Kikai Kabushiki Kaisa: *See—*
Tone, Syoiti; and Kubota, Norio, 4,512,526, Cl. 242-36.000.

Muri, David L., to Motorola, Inc. Apparatus and method for suppressing side lobe response in a digitally sampled system. 4,513,385, Cl. 364-572.000.

Muroi, Masayuki: *See—*
Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, 4,512,975, Cl. 424-121.000.

Murray, Patrick S.: *See—*
Boysen, Gerd C.; Murray, Patrick S.; and Robinson, Marquis B., 4,513,181, Cl. 200-50.00C.

Mushta, James T. Dental indicating paste and method of use. 4,512,741, Cl. 433-70.000.

Musser, Glenn A.; Rayfield, James F.; and Pucher, Richard A., to Sperry Corporation. Drive reverser actuating mechanism. 4,512,139, Cl. 56-11.200.

Muszak, Martin F.: *See*—
Blanding, Douglass L.; and Muszak, Martin F., 4,512,952, Cl. 422-63.000.
Mutai, Masahiko: *See*—
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,513,138, Cl. 546-48.000.
Muto, Rudolph. Selective tracheal bronchial catheter. 4,512,765, Cl. 604-119.000.
Myers, John G.; Logan, Douglas P.; and Walker, Jerry L., to Calgon Corporation. Residual fuel oil conditioners containing metal salts in aqueous solution. 4,512,774, Cl. 44-51.000.
MZW Maschinenfabrik Zuckermann Pachtgesellschaft mbH: *See*—
Schmidt, Erich, 4,512,380, Cl. 144-1.00A.
Nabb, Elis; and Eggert, Stig, to Oy Wartsila Ab. Door lock. 4,512,597, Cl. 292-143.000.
Nafissi-Varchei, M.Mehdi, to Schering Corporation. Anthelmintic benzimidazole carbamates. 4,512,998, Cl. 514-367.000.
Nagaoka, Satoshi: *See*—
Okazaki, Masaki; Tanabe, Osami; Nagaoka, Satoshi; Mihara, Yuji; Kimura, Keizo; and Umemoto, Makoto, 4,513,081, Cl. 430-550.000.
Nagase, Ushiro, to Kyoto Central Co. Ltd. Geothermal energy conversion system. 4,512,156, Cl. 60-641.200.
Nagel, Arthur A.: *See*—
Hauske, James R.; and Nagel, Arthur A., 4,512,982, Cl. 514-29.000.
Nakada, Pershing: *See*—
DeNicolo, William; and Nakada, Pershing, 4,512,760, Cl. 494-37.000.
Nakagawa, Shinichi; Ihara, Kiyohiko; and Sogabe, Toshio, to Daikin Kogyo Co., Ltd. Ethylene/tetrafluoroethylene or chlorotrifluoroethylene copolymer. 4,513,129, Cl. 526-249.000.
Nakagiri, Tadahiko, to Citizen Watch Company Limited. Liquid crystal matrix display device. 4,513,282, Cl. 340-765.000.
Nakaguchi, Osamu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.
Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Takimoto, Masatami; and Teramura, Mitsuyoshi, to Toyota Jidosha Kabushiki Kaisha. Variable venturi-type carburetor. 4,512,312, Cl. 123-439.000.
Nakamura, Takayoshi, to Kabushiki Kaisha Kito. Idling device for lever hoist. 4,512,555, Cl. 254-350.000.
Nakano, Hiromichi; Sasaya, Hideaki; Inagaki, Mitsuo; Matsui, Kazuma; and Yoshimura, Kunimasa, to Nippon Soken, Inc.; Nippondenso Co., Inc.; and Toyota Jidosha Kabushiki Kaisha. Combined rotary pump and compressor unit. 4,512,728, Cl. 418-3.000.
Nakao, Hisao: *See*—
Noda, Ichiro; Suekane, Yasuhiro; and Nakao, Hisao, 4,512,889, Cl. 210-225.000.
Nakao, Toshihiro, to Olympus Optical Co., Ltd. Accidental erasing preventative device for a cassette tape recorder. 4,513,330, Cl. 360-60.000.
Nakasuji, Kazuyuki: *See*—
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Nakatsukasa, Walter M.; and Mabe, James A., to Eli Lilly and Company. Functionally independent cloning vectors for use in streptomyces. 4,513,085, Cl. 435-253.000.
Narita, Ko: *See*—
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Narita, Toshihito: *See*—
Kishida, Kazuo; Yamamoto, Naoki; Nishida, Kozi; Narita, Toshihito; and Sato, Yasumasa, 4,513,111, Cl. 524-458.000.
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, to Fujitsu Limited. Developer materials for electrostatic images. 4,513,075, Cl. 430-108.000.
Nash, Robert J.; and Randall, Kent A., to Xerox Corporation. Stable conductive developer compositions. 4,513,074, Cl. 430-106.600.
Nassiri, Joe-Massoud, to Everest & Jennings, Inc. Wheel hub latch mechanism for power wheelchairs. 4,512,613, Cl. 301-1.000.
National Distillers and Chemical Corporation: *See*—
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,512,920, Cl. 252-573.000.
Speca, Anthony N., 4,513,095, Cl. 502-111.000.
National Research De Development: *See*—
Klinner, Wilfred E., 4,512,146, Cl. 56-364.000.
National Research Development Corporation: *See*—
Bailey, Warren P. N., 4,512,663, Cl. 356-446.000.
National Semiconductor Corporation: *See*—
Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., 4,512,815, Cl. 148-1.500.
Ramde, Amolak R.; Khadder, Wadie N.; and Krishna, Surinder, 4,512,816, Cl. 148-1.500.
Nauflett, George W., to United States of America, Navy. Method for the preparation of methylnitramine. 4,513,148, Cl. 564-109.000.
Naujalis, Pierre: *See*—
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Anderson, Jeff L., 4,512,940, Cl. 264-22.000.
Celio, John A., 4,513,371, Cl. 364-200.000.
Collins, Donald A.; and O'Hanlan, Thomas B., 4,513,420, Cl. 371-38.000.
Devchoudhury, Rathindra N., 4,513,389, Cl. 364-900.000.
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Neary, David, to Neary, David. Fuel preheater. 4,512,324, Cl. 123-557.000.
Neff, Karl: *See*—
Lipinski, Reinhard; and Neff, Karl, 4,512,208, Cl. 74-89.150.
Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; Saito, Isao; and Kitoh, Kyosuke, to Eisai Co., Ltd. 2-Methylchromone derivatives and process for their preparation. 4,513,145, Cl. 549-402.000.
Nehmiz, Peter: *See*—
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., 4,513,203, Cl. 250-491.100.
Nelson, Gunner E., to Ethyl Corporation. Hydride production at moderate pressure. 4,512,966, Cl. 423-644.000.
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., to Syntex (U.S.A.), Inc. Benzthiazine analogs as antiinflammatory agents. 4,512,990, Cl. 514-225.000.
Nestec, S.A.: *See*—
Clough, Graham, 4,513,015, Cl. 426-396.000.
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Neumann, Peter: *See*—
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New Process Industries, Inc.: *See*—
Benson, Glendon M., 4,512,150, Cl. 60-526.000.
Newman, Donald J.: *See*—
Dunphy, Gerald F.; and Newman, Donald J., 4,512,166, Cl. 70-366.000.
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Gordon, Paul, 4,512,981, Cl. 514-45.000.
Newton, Alan R. Speed reducer. 4,512,213, Cl. 74-805.000.
Neyer, Norbert, to LGZ Landis & Gyr Zug AG. Method and an apparatus for generating periodic digital time function signals. 4,513,387, Cl. 364-718.000.
Ng, Steven Y.; Penhale, Donald W.; and Heller, Jorge, to SRI International. Preparation of ketene acetals. 4,513,143, Cl. 549-335.000.
Ng, Yee S.; Jarvis, James G.; and Thompson, John R., to Eastman Kodak Company. Method and apparatus for thermally-assisted grounding of an electrographic imaging member. 4,512,653, Cl. 355-16.000.
Ng, Yiu-Keung: *See*—
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NGK Insulators, Ltd.: *See*—
Kato, Nobuhide; and Murase, Takao, 4,512,871, Cl. 204-429.000.
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NGK Spark Plug Co., Ltd.: *See*—
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Ngo, Peter D. T., to AT&T Bell Laboratories. AC plasma panel shift with intensity control. 4,513,281, Cl. 340-703.000.
Nichol, Charles A.: *See*—
Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., 4,512,992, Cl. 514-258.000.
Nicholson, Peter. Method of recording holographic images in white light image plane holograms. 4,512,624, Cl. 350-3.690.
Nieda, Yasuhiro; and Honda, Kiyokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Headlamp unit with timed switching between two lights. 4,513,357, Cl. 362-228.000.
Nielsen, Hans C. A.; and Schroeder, Roberto, to Industrias Penoles S.A. de C.V. Process for producing, from aluminous siliceous materials, clinker containing alkali metal aluminate and dicalcium silicate, and use thereof. 4,512,809, Cl. 106-103.000.
Nielsen, Mogens B., to Durofac-Kartro A/S. Tool shaft for a tool of the percussive and rotative type. 4,512,692, Cl. 408-226.000.
Nielson, Wayne G., to Sterner Lighting Systems, Incorporated. Lamp stabilizer. 4,513,359, Cl. 362-389.000.
Nieman, Mark D.: *See*—
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Niemann, Hans-Joachim; and Sprehe, Josef, to Kraftwerk Union Aktiengesellschaft. Method for the separation of uranium isotope compounds already converted isotope-selectively. 4,512,957, Cl. 423-3.000.
Nienhuis, James H.: *See*—
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Nihon Den-Nitsu Keiki Co. Ltd.: *See*—
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Nihoshi, Toshiaki, to Nippon Kogaku K.K. Polarizing microscope. 4,512,640, Cl. 350-510.000.
Niigata Engineering Co., Ltd.: *See*—
Takahashi, Susumu, 4,512,369, Cl. 137-614.040.
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Binnig, Rupert; Gerlach, Gunter; Nilles, Peter; and Pankatz, Jurgen, 4,512,811, Cl. 134-10.000.

Nillesen, Antonius H. H. J.: *See—*
Veendrick, Hendrikus J. M.; Pfennings, Leonardus C. M. G.; Raven, Johannes G.; and Nillesen, Antonius H. H. J., 4,513,388, Cl. 364-736.000.
Nilssen, Ole K. Thermally controllable variable frequency inverter. 4,513,364, Cl. 363-132.000.
Nilsson, Torsten; and Jakobsen, Kjell M., to PLM AB. Apparatus for blow molding a container having an upward bulged bottom. 4,512,735, Cl. 425-526.000.
Nippon Electric Co., Ltd.: *See—*
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Irabu, Takeru, 4,513,286, Cl. 343-5.0CF.
Nishino, Masakazu; and Fujisaki, Hisashi, 4,513,177, Cl. 179-81.00B.
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kumano, Shinji, 4,512,234, Cl. 84-433.000.
Nippon Kogaku K.K.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
Ogahara, Fumio, 4,512,421, Cl. 175-71.000.
Nippon Mining Co., Ltd.: *See—*
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Nippon Notion Kogyo Co., Ltd.: *See—*
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Nippon Yakin Kogyo Kabushiki Kaisha: *See—*
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Nishikawa, Kiyotada, to Yoshida Kogyo K.K. Method of connecting pull tab with slide fastener slider. 4,512,064, Cl. 24-429.000.
Nishikawa, Seiichi: *See—*
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Nishimura, Hiromi: *See—*
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Nishino, Masakazu; and Fujisaki, Hisashi, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Co., Ltd. Loud-speaking telephone system. 4,513,177, Cl. 179-81.00B.
Nissan Motor Company, Limited: *See—*
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Ichikawa, Sadao; and Kamiya, Tuyoshi, 4,512,297, Cl. 123-179.00H.
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Kubota, Shikibu; and Tsuji, Shisaku, 4,513,276, Cl. 340-52.00R.
Maeda, Kouzo; and Tsujimura, Harutoshi, 4,512,604, Cl. 296-65.00A.
Suzuki, Shunsuke; Mori, Masanobu; and Miyata, Takeshi, 4,512,383, Cl. 164-35.000.
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,512,751, Cl. 474-28.000.
Nixon, James E.: *See—*
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Noda, Ichiro; Suekane, Yasuhiro; and Nakao, Hisao, to Ishigaki Kiko Co., Ltd. Filter press. 4,512,889, Cl. 210-225.000.
Noguchi, Akio: *See—*
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Nolan, William D. Portable hair shampoo and scalp treatment basin. 4,512,043, Cl. 4-516.000.
Nomoto, Seiichiro: *See—*
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Nomura, Susumu; and Sato, Katsuharu, to Pioneer Video Corporation. Error detecting system of video/audio disc player. 4,513,408, Cl. 369-46.000.
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Robbins, John D., 4,513,221, Cl. 313-402.000.
North American Philips Corporation: *See—*
Barnes, Casper W., 4,512,196, Cl. 73-620.000.
Northeastern University: *See—*
Whang, Sung-Hyun, 4,512,826, Cl. 148-407.000.
Northern Petrochemical Company: *See—*
Fries, Richard W., 4,513,117, Cl. 525-60.000.
Northern Telecom Limited: *See—*
Harman, Stephen G., 4,513,250, Cl. 328-163.000.
Phillips, Loi; Austin, Hollis B.; and Blakeslee, Kenneth S., 4,513,179, Cl. 179-175.30R.
Suffi, Louis; Golden, James E.; and Jaycox, Donald F., 4,513,171, Cl. 174-41.000.
Northwest Instrument Systems, Inc.: *See—*
Henry, Michael D.; Ableidinger, Bruce J.; and Agarwal, Nirmal K., 4,513,395, Cl. 364-900.000.
Norton, Dennis J. Gate latch. 4,512,105, Cl. 49-394.000.
Norton, William J., to C. R. Bard, Inc. Venting assembly for a sealed body fluid drainage device. 4,512,771, Cl. 604-824.000.
Nose, Isamu; and Umehara, Akihiko, to Oki Electric Industry, Co., Ltd. Speech recognition system. 4,513,436, Cl. 381-43.000.
Notari, Bruno: *See—*
Fattore, Vittorio; Notari, Bruno; Paggini, Alberto; and Lagana , Vincenzo, 4,513,100, Cl. 502-303.000.
Novak, Paul G.; and Specht, Theodore R., to Westinghouse Electric Corp. Core form transformer for selective cancellation of subsynchronous resonance. 4,513,243, Cl. 323-361.000.
Nozaki, Keizo, to Yamato Mishin Seizo Kabushiki Kaisha. Hemming guide control for an overlock sewing machine. 4,512,270, Cl. 112-140.000.
Nozawa, Ryoichiro; and Kiya, Nobuyuki, to Fujitsu Fanuc Limited. Method and apparatus for controlling zero-point return of a movable element. 4,513,234, Cl. 318-594.000.
NPI New Products Investment AB: *See—*
Stenvall, Carl-Johan, 4,512,590, Cl. 280-11.230.
Numbers, Jody L.: *See—*
Green, Jacqueline M.; and Numbers, Jody L., 4,512,489, Cl. 220-19.000.
Nussdorfer, Theodore J.: *See—*
Sebestyen, George; Sinclair, Ronald R.; Smith, John A.; Sands, Timothy B.; and Nussdorfer, Theodore J., 4,512,537, Cl. 244-3.210.
Obrecht, Georges, to Alsthom-Atlantique. Anti-unscrewing devices. 4,512,596, Cl. 285-81.000.
Occidental Research Corporation: *See—*
Marvin, Dean C.; and Ives, Neil A., 4,513,200, Cl. 250-227.000.
O'Connell, Dennis M., to Corning Glass Works. Adjustable height magnetic stirrer. 4,512,666, Cl. 366-249.000.
O'Donnell, Timothy W.: *See—*
Olson, Daniel; R.; and O'Donnell, Timothy W., 4,513,349, Cl. 361-311.000.
Ogahara, Fumio, to Nippon Kokan Kabushiki Kaisha. Method for drilling coke oven top brick. 4,512,421, Cl. 175-71.000.
Ogasawara, Mitsuhiko: *See—*
Oshima, Masao; Kato, Yutaka; Ogasawara, Mitsuhiko; and Futamura, Osamu, 4,512,936, Cl. 261-93.000.
Ogawa, Akira; and Asano, Toshiaki, to Fuji Photo Film Co., Ltd. Aqueous ink composition for ink-jet printing. 4,512,807, Cl. 106-22.000.
Ogden Industries Pty. Ltd.: *See—*
Dunphy, Gerald F.; and Newman, Donald J., 4,512,166, Cl. 70-366.000.
Ogi, Katsumi: *See—*
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,512,557, Cl. 266-171.000.
O'Hanlan, Thomas B.: *See—*
Collins, Donald A.; and O'Hanlan, Thomas B., 4,513,420, Cl. 371-38.000.
Ohno, Hideaki: *See—*
Ito, Tokuhisa; Ohno, Hideaki; Kurata, Izumi; and Okuyama, Takashi, 4,512,642, Cl. 354-4.000.
Ohno, Junichi; and Konishi, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device capable of structural selection. 4,513,310, Cl. 357-68.000.
Ohta, Hideo; Hakuzen, Tatuzo; Ito, Yasunori; and Takagi, Fusao, to Satosen Co., Ltd. Process for producing printed circuit boards. 4,512,829, Cl. 156-659.100.
Ohwaki, Shinji: *See—*
Kunugi, Katsuo; Suzuki, Togi; Konishi, Tadashi; and Ohwaki, Shinji, 4,513,114, Cl. 524-706.000.
Ohyama, Hiroshi; Morita, Ken; Wada, Takuo; and Miyahara, Masahiko, to Hokko Chemical Industry Co., Ltd. 1,2,4-Triazole derivatives and fungicidal composition containing the same. 4,512,989, Cl. 514-383.000.
Oi, Naobumi; and Kitahara, Hajimu, to Sumitomo Chemical Company, Limited. Packing materials for chromatographic use and a method for analysis of an enantiomer mixture using the same. 4,512,898, Cl. 210-656.000.
Oiwa, Isao, to Sumitomo Rubber Industries, Ltd. Internal mixer. 4,512,664, Cl. 366-76.000.

Okada, Satoshi: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.

Okada, Seiji: *See—*
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,513,075, Cl. 430-108.000.

Okada, Takao: *See—*
Kobayashi, Yuji; and Okada, Takao, 4,513,316, Cl. 358-106.000.

Okai, Tsukasa; and Araki, Shuichi, to Dainippon Screen Seizo Kabushiki Kaisha. Method of compressing data. 4,513,444, Cl. 382-56.000.

Okamura, Shigeru, to Canon Kabushiki Kaisha. Ink jet printer reservoir. 4,513,297, Cl. 346-140.00R.

Okazaki, Masaki; Tanabe, Osami; Nagaoka, Satoshi; Mihara, Yuji; Kimura, Keizo; and Umemoto, Makoto, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,513,081, Cl. 430-550.000.

Oki Electric Industry, Co., Ltd.: *See—*
Nose, Isamu; and Umehara, Akihiko, 4,513,436, Cl. 381-43.000.

Okinaka, Yutaka: *See—*
Abys, Joseph A.; and Okinaka, Yutaka, 4,512,963, Cl. 423-387.000.

Okuyama, Hirofumi: *See—*
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,513,075, Cl. 430-108.000.

Okuyama, Takashi: *See—*
Ito, Tokuhisa; Ohno, Hideaki; Kurata, Izumi; and Okuyama, Takashi, 4,512,642, Cl. 354-4.000.

Olah, George A. Condensation of natural gas or methane into gasoline range hydrocarbons. 4,513,164, Cl. 585-700.000.

Olin Corporation: *See—*
Foust, Julian D.; Ysidro, Leonard M., Sr.; and Cross, Danny R., 4,512,701, Cl. 414-101.000.
Gray, Thomas J.; and Masse, Norman G., 4,513,149, Cl. 564-449.000.
Schiessl, Henry W., 4,512,909, Cl. 252-188.280.
Wright, David B., 4,512,853, Cl. 204-1.00T.

Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, to SKF Kugellagerfabriken GmbH. Sealed bearing cup for universal joint. 4,512,670, Cl. 384-147.000.

Olschewski, Armin; Herrmann, Gerhard; Bauer, Bernhard; and Zirk, Elisabeth, to SKF Kugellagerfabriken GmbH. Front seal for bearing cups. 4,512,672, Cl. 384-477.000.

Olson, Charles L.; and Monahan, John F., to RCA Corporation. Black level clamp for television signals. 4,513,321, Cl. 358-172.000.

Olson, Daniel; R.; and O'Donnell, Timothy W., to General Electric Company. Acrylate-containing mixed ester monomers and polymers thereof useful as capacitor dielectrics. 4,513,349, Cl. 361-311.000.

Olson, Kenneth C.: *See—*
Jones, Andrew J. S.; Olson, Kenneth C.; and Shire, Steven J., 4,512,922, Cl. 260-112.00R.

Olympus Optical Co., Ltd.: *See—*
Kohara, Satsuki; and Ono, Noriaki, 4,512,870, Cl. 204-416.000.
Mizokami, Kazunori, 4,512,648, Cl. 354-443.000.
Nakao, Toshihiro, 4,513,330, Cl. 360-60.000.
Tsuboshima, Kosaku; and Yoshinari, Shigeru, 4,512,852, Cl. 204-1.00T.

Omron Tateisi Electronics Co.: *See—*
Miyamoto, Kiyoshi; and Ueda, Kenji, 4,513,257, Cl. 331-65.000.

Ono, Noriaki: *See—*
Kohara, Satsuki; and Ono, Noriaki, 4,512,870, Cl. 204-416.000.

Ono, Takashi: *See—*
Hasebe, Koshi; Miura, Kunio; Ono, Takashi; Akutsu, Kazushi; and Minami, Kazuaki, 4,513,377, Cl. 364-449.000.

Ono, Yoshifumi: *See—*
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.

Oppama Kogyo Kabushiki Kaisha: *See—*
Watanabe, Hiromi, 4,512,303, Cl. 123-335.000.

Orain, Michel A., to Glaenzer Spicer. Transmission joint and in particular an articulated constant-speed joint for a motor vehicle. 4,512,750, Cl. 464-111.000.

Orban, John M., to Vivitar Corporation. Automatic battery charger with thermal control. 4,513,238, Cl. 320-23.000.

Orndorff, James A., Jr.: *See—*
Hale, David R.; Owen, William A.; and Orndorff, James A., Jr., 4,512,684, Cl. 405-217.000.

Osaka Suda Co. Ltd.: *See—*
Sakai, Takaaki, 4,513,029, Cl. 427-204.000.

Oschmann, Klaus. Automatic filling device for battery cells. 4,512,378, Cl. 141-98.000.

Oshima, Masao; Kato, Yutaka; Ogasawara, Mitsuhiko; and Futamura, Osamu, to Ebara Corporation; and Ebara-Infilco Co., Ltd. Aeration apparatus. 4,512,936, Cl. 261-93.000.

Oswald, Leo A.: *See—*
Rauschert, William C.; and Oswald, Leo A., 4,512,530, Cl. 242-67.30R.

Otis Elevator Company: *See—*
Koppensteiner, Werner, 4,512,444, Cl. 187-67.000.

Otis Engineering Corporation: *See—*
Gano, John C.; and Perkins, Donald H., 4,512,399, Cl. 166-120.000.

Otsu, Keiichiro: *See—*
Kaku, Yoshihiro; and Otsu, Keiichiro, 4,512,175, Cl. 72-360.000.

Otsuka, Toru, to Sony Corporation. Head positioning apparatus. 4,513,334, Cl. 360-75.000.

Otto, Wolfgang K. F., to Milliken Research Corporation. Mechanical surface finishing apparatus for textile fabric. 4,512,065, Cl. 26-28.000.

Ottsen, Henning; and Barker, Thruburn, to Mobil Oil Corporation. Marine cable location system. 4,513,401, Cl. 367-19.000.

Outboard Marine Corporation: *See—*
Mohr, James W., 4,512,294, Cl. 123-73.00R.

Owen, William A.: *See—*
Hale, David R.; Owen, William A.; and Orndorff, James A., Jr., 4,512,684, Cl. 405-217.000.

Owens-Corning Fiberglas Corporation: *See—*
Rauschert, William C.; and Oswald, Leo A., 4,512,530, Cl. 242-67.30R.
Ritter, George W., II, 4,512,913, Cl. 252-313.100.

Owens-Illinois, Inc.: *See—*
Irwin, George W.; and Mumford, Eustace H., 4,512,792, Cl. 65-161.000.
Jabarin, Saleh A., 4,512,948, Cl. 264-521.000.

Owlett, Lois. Shopping organizer. 4,512,504, Cl. 224-42.46R.

Oy Wartsila Ab: *See—*
Nabb, Elis; and Eggert, Stig, 4,512,597, Cl. 292-143.000.

P.C.H. Constructions Pty. Ltd.: *See—*
Willoughby, John C., 4,512,119, Cl. 52-58.000.

Pachschwoll, Heino, to Zevatron GmbH, Gesellschaft fur Fertigungseinrichtungen der Elektronik. Method and apparatus for the machine soldering of workpieces. 4,512,508, Cl. 228-180.100.

Pacific Power Control, Inc.: *See—*
Thomas, Stanley N., 4,513,224, Cl. 315-141.000.

Pack Image, Inc.: *See—*
Stone, Orison W., 4,512,755, Cl. 493-92.000.

Pacradouni, Chahan: *See—*
Carydias, Roger; and Pacradouni, Chahan, 4,512,121, Cl. 52-125.200.

Padilla, Antonio A.: *See—*
Rodriguez, Larry A.; Padilla, Antonio A.; and Spake, Ned B., 4,512,387, Cl. 165-1.000.

Paffen nee Siebert, Ursula: *See—*
Struck, Bernd D.; Dias, Francisco J.; Luhleich, Hartmut; and Paffen nee Siebert, Ursula, 4,512,858, Cl. 204-104.000.

Pagac, William T.: *See—*
Barnhill, Martin L., III; and Pagac, William T., 4,512,220, Cl. 81-121.100.

Paggini, Alberto: *See—*
Fattore, Vittorio; Notari, Bruno; Paggini, Alberto; and Lagana , Vincenzo, 4,513,100, Cl. 502-303.000.

Pak Pro International, N.V.: *See—*
Torterotot, Roland, 4,512,133, Cl. 53-167.000.

Palmer, James L.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.

Palmieri, Joseph M.: *See—*
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., 4,513,268, Cl. 335-35.000.

Pampell, Davy G.: *See—*
Jandrasi, Frank J.; Pampell, Davy G.; and Stinson, Walter J., 4,512,363, Cl. 137-375.000.

Pancotti, Santino; and Mariani, Renato, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Helicopter rotor. 4,512,717, Cl. 416-134.00A.

Pane, Francis C., Jr.: *See—*
Striebel, Edmund E.; Matthews, John A.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,512,158, Cl. 60-740.000.

Paneccasio, Vincent, to Enthone, Incorporated. Zinc plating solutions and method utilizing ethoxylated/propoxylated polyhydric alcohols. 4,512,856, Cl. 204-55.00R.

Pankatz, Jurgen: *See—*
Binnig, Rupert; Gerlach, Gunter; Nilles, Peter; and Pankatz, Jurgen, 4,512,811, Cl. 134-10.000.

Papp, Uwe: *See—*
Albrecht, Wolf-Wigand; Papp, Uwe; and Behrens, Dieter, 4,512,805, Cl. 75-244.000.

Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 1,3,5-Triazinones and their use for controlling undesirable plant growth. 4,512,797, Cl. 71-93.000.

Park, Hong K. Trammel head assembly. 4,512,081, Cl. 33-27.00C.

Parker, Marshall M.: *See—*
Seitz, Charles L.; Grunewald, Paul; Parker, Marshall M.; and Stafford, Irvin G., 4,513,278, Cl. 340-347.0DA.

Parsons, John R.: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,512,038, Cl. 3-1.900.

Parsson, Nils O., to Saab-Scania AB. Arrangement in a vehicle seat. 4,512,609, Cl. 297-331.000.

Parton, Brian: *See—*
Anderton, Kenneth; Hall, Nigel; Parton, Brian; Renfrew, Andrew H. M.; and Shaw, Malcolm G., 4,512,773, Cl. 8-657.000.

Pasenau, Hartmut: *See—*
Sarh, Branko; and Pasenau, Hartmut, 4,512,837, Cl. 156-189.000.

Pasquarella, Stephen T., to Va. Inc. Control circuit for inductive load. 4,513,345, Cl. 361-155.000.

Patchett, Arthur A.; and Wu, Mu T., to Merck & Co., Inc. Dipeptides containing thialysine and related amino acids as antihypertensives. 4,512,979, Cl. 514-2.000.

Patel, Chandrakant B., to RCA Corporation. Buzz reduction for intercarrier type television sound detection. 4,513,323, Cl. 358-197.000.

Patil, Ram S.; Johnson, Donald F.; and Quasney, John T., to Inland Steel Company. Differentially coated galvanized steel strip and method and apparatus for producing same. 4,513,033, Cl. 427-349.000.

Patton, James B.: *See*—
Regalbuto, John A.; Patton, James B.; and Sumner, Cyril R., 4,512,418, Cl. 175-4.560.

Paul, Charles T.: *See*—
Ganzi, Gary C.; and Paul, Charles T., 4,512,892, Cl. 210-493.200.

Paul Wurth S.A.: *See*—
Mailliet, Pierre; and Ulveling, Leon, 4,512,702, Cl. 414-202.000.

Paula Blaine International, Ltd.: *See*—
Levine, Paula B., 4,512,581, Cl. 273-153.00R.

Paulus, Wilfried: *See*—
Kuhle, Engelbert; Klauke, Erich; Paulus, Wilfried; and Genth, Hermann, 4,513,003, Cl. 514-411.000.

Pauwels, Michael A.; Wright, Danny O.; Harvey, Bruce J.; and Bauer, Thomas J., to Allied Corporation. Extended range throttle body fuel injection system. 4,512,317, Cl. 123-478.000.

Payne, John D., to Holmen Chemicals Limited. Pellet durability tester. 4,512,180, Cl. 73-7.000.

Payne, Robert N.: *See*—
Lee, Francis C.; Mills, Ross N.; Payne, Robert N.; and Talke, Frank E., 4,513,299, Cl. 346-140.00R.

Peachey, Kenneth G., to Sunwood Energy Products, Inc. Portable thermal exchange system. 4,512,334, Cl. 126-430.000.

Peachtree Doors, Inc.: *See*—
Banford, Dennis W., 4,512,124, Cl. 52-207.000.

Pecen, Jiri: *See*—
Galbraith, Lee K.; and Pecen, Jiri, 4,512,659, Cl. 356-243.000.

Peckson USA Corp.: *See*—
Splinter, Bob C., 4,513,205, Cl. 250-507.100.

Peehs, Martin: *See*—
Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, 4,512,939, Cl. 264-0.500.

Pelc, Norbert J.: *See*—
Sandrik, John M.; and Pelc, Norbert J., 4,513,078, Cl. 430-496.000.

Pellet, Regis J.: *See*—
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,512,875, Cl. 208-114.000.

Penhale, Donald W.: *See*—
Ng, Steven Y.; Penhale, Donald W.; and Heller, Jorge, 4,513,143, Cl. 549-335.000.

Penhard, Serge J., to Thomson-CSF. Device for the elimination of n^{th} trace moving echoes and interference echoes in a radar. 4,513,287, Cl. 343-5.0CF.

Pennel, Jean-Francois; and Vesnier, Patrick H. Coupling member and method of manufacturing such a coupling member. 4,512,176, Cl. 72-367.000.

Pennwalt Corporation: *See*—
Bloomfield, Philip E., 4,512,431, Cl. 177-210.00R.
Chen, Johnson C. H.; and Eichelberger, John L., 4,513,053, Cl. 428-221.000.

Pepin, Jean P. Insulation support. 4,512,130, Cl. 52-404.000.

Perkin-Elmer Corporation, The: *See*—
Groeschner, Donald L., 4,512,362, Cl. 137-356.000.
Jones, Robert A., 4,512,107, Cl. 51-56.00R.

Perkins, Donald H.: *See*—
Gano, John C.; and Perkins, Donald H., 4,512,399, Cl. 166-120.000.

Permacel: *See*—
Dabroski, Winifred C., 4,513,059, Cl. 428-355.000.

Perret, Andre: *See*—
Brun, Marcel; Perret, Andre; and Cailleux, Claude, 4,512,695, Cl. 409-134.000.

Pesch, Wolfgang; and Beer, Gunter, to Henkel Kommanditgesellschaft. Binder compositions based on alkali metal silicate solutions. 4,512,808, Cl. 106-83.000.

Pesson, Marcel: *See*—
Joannic, Michel; Roquet, Francoise; and Pesson, Marcel, 4,513,001, Cl. 514-394.000.

Peters, Alan W.; Kim, Gwan; and Ernest, Michael V., to W. R. Grace & Co. Small bead auto exhaust catalyst. 4,513,101, Cl. 502-304.000.

Peters, John W., to Hughes Aircraft Company. Process for forming sulfide layers. 4,513,057, Cl. 428-336.000.

Peters, Rex B., to Sundstrand Data Control, Inc. Two axis angular rate and specific force sensor utilizing vibrating accelerometers. 4,512,192, Cl. 73-505.000.

Peterson, John P., Jr.: *See*—
Anstine, Larry D.; James, Dean B.; Melaika, Edward A.; and Peterson, John P., Jr., 4,512,921, Cl. 252-626.000.

Peterson, Marvin A., to General Electric Company. Coating composition. 4,513,113, Cl. 524-602.000.

Petri, Randy J.: *See*—
Claar, Terry D.; and Petri, Randy J., 4,512,388, Cl. 165-1.000.

Petrick, David C., to Bretford Manufacturing, Inc. Universal printer stand. 4,512,543, Cl. 248-670.000.

Petro-Tex Chemical Corporation: *See*—
McFarland, Cecil G., 4,513,159, Cl. 585-625.000.

Petrzelka, Miloslav; and Taureg, Herbert, to Uni-Cardan Aktiengesellschaft. Universal joint. 4,512,679, Cl. 403-57.000.

Pettit, Douglas L.; and Piilola, Calvin E., to General Resource Corporation. Filter bag clamp. 4,512,789, Cl. 55-378.000.

Peyton, John J., to Industrial Automation Corp. Force balanced actuator for mechanically actuated container grippers. 4,512,456, Cl. 198-479.000.

Pfanzer, Gerhard, to Black & Decker Inc. Jig saw with orbital mechanism. 4,512,078, Cl. 30-393.000.

Pfennings, Leonardus C. M. G.: *See*—
Veendrick, Hendrikus J. M.; Pfennings, Leonardus C. M. G.; Raven, Johannes G.; and Nillesen, Antonius H. H. J., 4,513,388, Cl. 364-736.000.

Pfister, Rudolf: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,513,002, Cl. 514-408.000.

Pfizer Inc.: *See*—
Hauske, James R.; and Nagel, Arthur A., 4,512,982, Cl. 514-29.000.
Wirth, Emil J., Jr., 4,512,800, Cl. 75-53.000.

Pham Ngu, Tung, to Thomson-CSF. Bistable logic circuit using field effect transistors with a low voltage threshold and storage device incorporating such a circuit. 4,513,398, Cl. 365-189.000.

Phillips, Edwin. Non-stick glass stopcock. 4,512,364, Cl. 137-375.000.

Phillips, Lot; Austin, Hollis B.; and Blakeslee, Kenneth S., to Northern Telecom Limited. Loop test circuit. 4,513,179, Cl. 179-175.30R.

Phillips Mine & Mill, Inc.: *See*—
Thompson, John P., 4,512,706, Cl. 414-373.000.

Phillips Petroleum Company: *See*—
Kukes, Simon G.; and Banks, Robert L., 4,513,099, Cl. 502-228.000.

Phillips, Robert V. Exercise bicycle apparatus particularly adapted for controlling video games. 4,512,567, Cl. 272-73.000.

Piccolo, Dominic J.: *See*—
Carroll, Thomas J.; Corsello, Vincent G.; Glass, Michael; and Piccolo, Dominic J., 4,513,012, Cl. 426-5.000.

Picha, Josef: *See*—
Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, 4,512,923, Cl. 260-112.5LH.

Pichova, Drahomira: *See*—
Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, 4,512,923, Cl. 260-112.5LH.

Picone, John A. Electric powered adjustable wrench. 4,512,221, Cl. 81-170.000.

Pierce, Clifford R., to Vacuum Furnace Systems Corporation. Hot zone arrangement for use in a vacuum furnace. 4,512,737, Cl. 432-205.000.

Piilola, Calvin E.: *See*—
Pettit, Douglas L.; and Piilola, Calvin E., 4,512,789, Cl. 55-378.000.

Pike, Lawrence W.; Zscheile, John W., Jr.; and Spencer, Billie M., to Sperry Corporation. Quasi coherent two-way ranging apparatus. 4,513,285, Cl. 343-5.0PN.

Pioneer Electronic Corporation: *See*—
Yokogawa, Fumihiko, 4,513,242, Cl. 323-352.000.
Yoshida, Kobun, 4,513,336, Cl. 360-105.000.

Pioneer Video Corporation: *See*—
Nomura, Susumu; and Sato, Katsuharu, 4,513,408, Cl. 369-46.000.

Piotrowski, Tadeusz W., to Cincinnati Milacron Inc. Pallet receiver with compliant pin and socket registration. 4,512,068, Cl. 29-33.00P.

Pirkle, James C.: *See*—
Wright, Franklin J.; Richard, Michael A.; and Pirkle, James C., 4,513,104, Cl. 518-714.000.

Pitozzi, Luigi, to SAME S.p.A. Delivery-regulation unit for in-line injection pumps. 4,512,305, Cl. 123-364.000.

Pittsburgh Brass Manufacturing Company: *See*—
Caralli, Michael J.; and Friedline, Gary W., 4,512,781, Cl. 55-26.000.

Plambeck, Eric D.: *See*—
Kompanek, Harry W.; Ligman, James R.; and Plambeck, Eric D., 4,512,402, Cl. 166-249.000.

Planning Research Corporation: *See*—
Walter, Gerard O.; and Sheppard, William D., 4,513,390, Cl. 364-900.000.

Plante, Jean-Paul. Hand truck. 4,512,591, Cl. 280-47.350.

PLASTIVER S.a.s. di Giovanni e Vittorio VIGANO & C.: *See*—
Vigano , Giovanni, 4,512,945, Cl. 264-263.000.

Plastofilm Industries, Inc.: *See*—
Harding, LeRoy A., 4,512,474, Cl. 206-461.000.

Platz, Rolf: *See*—
Rieber, Norbert; Platz, Rolf; and Jung, Johann, 4,512,795, Cl. 71-88.000.

Pleass, Charles M.: *See*—
Hicks, Douglas C.; and Pleass, Charles M., 4,512,886, Cl. 210-170.000.

PLM AB: *See*—
Nilsson, Torsten; and Jakobsen, Kjell M., 4,512,735, Cl. 425-526.000.

Plummer, Mark A., to Marathon Oil Company. Conversion of aromatics to iso-paraffins using a $NaAlCl_4/HAlCl_4$ molten salt catalyst system. 4,513,163, Cl. 585-700.000.

Poclain: *See*—
Boichu, Claude P.; and Yeou, Victor, 4,512,708, Cl. 414-694.000.

Poetsch, Dieter; Massmann, Volker; Becker, Werner; and Wagner, Horst, to Robert Bosch GmbH. Television scanning of wide frame motion picture films. 4,513,324, Cl. 358-214.000.

Pohland, Horst; and Tielens, Arthur J., to Alcoa Chemie GmbH. Method for the recovery of alumina. 4,512,959, Cl. 423-121.000.

Pohlenz, Elmer E.: *See*—
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.

Pohndorf, Peter J., to Cordis Corporation. Percutaneous lead introducing system and method. 4,512,351, Cl. 128-786.000.

Poindexter, Daniel J.: *See*—
Cunningham, George F., Jr.; Lewis, John W.; McClure, Robert B.; and Poindexter, Daniel J., 4,512,841, Cl. 156-345.000.

Pollner, Jurgen: *See*—
Molzer, Peter; Pollner, Jurgen; Topic, Nicola; Trummer, Gregor; and Zurek, Rudolf, 4,512,560, Cl. 269-20.000.

Porcari, Guiliano: *See*—
Robinson, Lee F.; Salimbeni, Francesco; Porcari, Guiliano; and Dente, Mario, 4,512,956, Cl. 422-270.000.

Porta Systems Corp.: *See*—
Carney, William V.; and Fasano, Michael, 4,512,622, Cl. 339-103.00M.

Pospisek, Jan: *See*—
Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, 4,512,923, Cl. 260-112.5LH.

Potts, Garfield C.: *See*—
Ruth, John V.; and Potts, Garfield C., 4,512,323, Cl. 123-557.000.

Pourarian, Faiz: *See*—
Wallace, William E.; and Pourarian, Faiz, 4,512,965, Cl. 423-644.000.

PPG Industries, Inc.: *See*—
Chamberlin, Ronald D., 4,512,857, Cl. 204-98.000.
Criss, Russell C.; and Gillery, F. Howard, 4,512,863, Cl. 204-192.00R.
Gillery, F. Howard, 4,512,864, Cl. 204-192.00P.
Thomaswick, Ronald J.; and Rowley, James R., 4,512,473, Cl. 206-454.000.
Thompson, Ralph B., 4,513,146, Cl. 560-231.000.

ppm, Inc.: *See*—
Shofner, Frederick M., 4,512,060, Cl. 19-200.000.

Pratt, W. Robert: *See*—
Macur, George J.; Pratt, W. Robert; and Sharkness, James E., 4,512,900, Cl. 210-748.000.

Pressure Systems, Inc.: *See*—
Sexton, John M., 4,512,191, Cl. 73-337.500.

Pringle, Ronald E., to Camco Incorporated. Fluid actuated energy charged well service line cutter. 4,512,411, Cl. 166-54.500.

Probst, Timothy F.: *See*—
Robinson, Mary K.; and Probst, Timothy F., 4,512,134, Cl. 53-248.000.

Procedyne Corp.: *See*—
Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., 4,512,821, Cl. 148-16.500.

Procter & Gamble Company, The: *See*—
Lavash, Bruce W., 4,513,051, Cl. 428-212.000.
Trinh, Toan, 4,512,677, Cl. 401-27.000.

PROMA Produkt-und Marketing Gesellschaft m.b.H.: *See*—
Lipinski, Reinhard; and Neff, Karl, 4,512,208, Cl. 74-89.150.

Propsom, George F., to Western Publishing Company, Inc. Improved game board with pieces cooperating for rotation. 4,512,584, Cl. 273-282.000.

Proscia, George E.: *See*—
Katz, Saul N.; and Proscia, George E., 4,513,136, Cl. 544-275.000.

Prusak, John J.: *See*—
Thorn, Joseph H.; and Prusak, John J., 4,512,455, Cl. 198-404.000.

Prutec Limited: *See*—
Simon, Donald R., 4,513,066, Cl. 429-42.000.

Pucher, Richard A.: *See*—
Musser, Glenn A.; Rayfield, James F.; and Pucher, Richard A., 4,512,139, Cl. 56-11.200.

Puhringer, Franz, to Steyr-Daimler-Puch Aktiengesellschaft. Lathe. 4,512,223, Cl. 82-2.500.

Purdes, Andrew J.; and Bonifield, Thomas D., to Texas Instruments Incorporated. Plasma reactor with reduced chamber wall deposition. 4,513,021, Cl. 427-38.000.

Purdes, Andrew J.: *See*—
Bonifield, Thomas D.; and Purdes, Andrew J., 4,512,283, Cl. 118-723.000.

Putman, Thomas H., to Westinghouse Electric Corp. Method and apparatus for selective cancellation of subsynchronous resonance. 4,513,240, Cl. 323-210.000.

QMP, Inc.: *See*—
King, Shaylor E., 4,512,600, Cl. 292-338.000.

Quasney, John T.: *See*—
Patil, Ram S.; Johnson, Donald F.; and Quasney, John T., 4,513,033, Cl. 427-349.000.

R.Q.O. Holding Company: *See*—
Feitzinger, Eduard; and Seminski, Robert B., 4,512,654, Cl. 355-27.000.

Rabenau, Albrecht: *See*—
Kreuer, Klaus-Dieter; Weppner, Werner; and Rabenau, Albrecht, 4,513,069, Cl. 429-192.000.

Rabo, Jule A.: *See*—
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,512,875, Cl. 208-114.000.

Racal Acoustics Limited: *See*—
Gorman, Anthony G.; Smith, Peter L.; and Barrett, Paul Q., 4,513,413, Cl. 370-30.000.

Racine, Jacques, to Hydro-Quebec. Levering tool for manhole cover. 4,512,554, Cl. 254-131.000.

Racz, William B.: *See*—
Santucci, Edward A.; and Racz, William B., 4,512,743, Cl. 433-217.000.

Rader, Charles P., to Monsanto Company. Method of treating diene rubber and improved rubber compositions. 4,513,110, Cl. 524-432.000.

Ragan, Lawrence H., to Texas Instruments Incorporated. Programmable frequency converting filter. 4,513,260, Cl. 333-165.000.

Raible, Donald A., to Bentley Laboratories, Inc. Body implantable connector. 4,512,761, Cl. 604-8.000.

Ramde, Amolak R.; Khadder, Wadie N.; and Krishna, Surinder, to National Semiconductor Corporation. High-density IC isolation technique capacitors. 4,512,816, Cl. 148-1.500.

Rand McNally & Company: *See*—
Breen, Thomas J., 4,512,595, Cl. 283-70.000.

Randall, Kent A.: *See*—
Nash, Robert J.; and Randall, Kent A., 4,513,074, Cl. 430-106.600.

Rangaswamy, Avvari. Analgesic syringe. 4,512,768, Cl. 604-191.000.

Rapp, Edward D. Detachable patient serving trays. 4,512,607, Cl. 297-153.000.

Rasmussen, Robert R. Casing arrangement for partition end caps. 4,512,118, Cl. 52-39.000.

Rathmayr, Heinz: *See*—
Brasseur, Georg; and Rathmayr, Heinz, 4,512,306, Cl. 123-367.000.

Raue, Roderich; Huhne, Volker; and Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Preparation of cationic methine dyestuffs. 4,513,142, Cl. 548-507.000.

Rauschert, William C.; and Oswald, Leo A., to Owens-Corning Fiberglas Corporation. Apparatus for handling split-batt rolls. 4,512,530, Cl. 242-67.30R.

Rausing, Anders R., to Tetra Pak Developpement SA. Extruded longitudinal joint. 4,512,838, Cl. 156-203.000.

Rausing, Hans, to Tetra Pak Developpement SA. Method for manufacturing a tube package. 4,512,832, Cl. 156-86.000.

Raven, Johannes G.: *See*—
Veendrick, Hendrikus J. M.; Pfennings, Leonardus C. M. G.; Raven, Johannes G.; and Nillesen, Antonius H. H. J., 4,513,388, Cl. 364-736.000.

Raychem Corporation: *See*—
Kridl, Thomas A.; and Claunch, Carney P., II, 4,512,833, Cl. 156-94.000.

Rayfield, James F.: *See*—
Musser, Glenn A.; Rayfield, James F.; and Pucher, Richard A., 4,512,139, Cl. 56-11.200.

Rayner, David A.: *See*—
Hayhurst, Gordon A.; and Rayner, David A., 4,512,681, Cl. 403-371.000.

Raytheon Company: *See*—
Mehrotra, Deepak; Shaw, Gerard J.; Go, Jok Y.; and Kant, Rajni, 4,512,076, Cl. 29-578.000.

RCA Corporation: *See*—
Bowman, David F., 4,513,292, Cl. 343-795.000.
Chen, Hsing-Yao, 4,513,222, Cl. 313-412.000.
Datta, Pabitra, 4,512,916, Cl. 252-511.000.
Deyer, Craig E., 4,513,394, Cl. 364-900.000.
Fairbanks, David W., 4,513,410, Cl. 369-126.000.
Filliman, Paul, 4,513,322, Cl. 358-181.000.
Hsu, Sheng T., 4,512,073, Cl. 29-571.000.
Ipri, Alfred C.; and Stewart, Roger G., 4,513,397, Cl. 365-185.000.
Olson, Charles L.; and Monahan, John F., 4,513,321, Cl. 358-172.000.
Patel, Chandrakant B., 4,513,323, Cl. 358-197.000.
Robinson, John W.; and Kaganowicz, Grzegorz, 4,512,284, Cl. 118-723.000.
Thorn, Joseph H.; and Prusak, John J., 4,512,455, Cl. 198-404.000.
VanBreemen, Bertram, 4,512,631, Cl. 350-128.000.

Ready, Robert J.; Whipple, Donald E.; and Sferra, James P., to Lighting Systems Inc. Sign frame and method for factory installing flexible sign facing material thereon. 4,512,098, Cl. 40-610.000.

Reaktor Brennelement Union GmbH: *See*—
Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, 4,512,939, Cl. 264-0.500.

Recker, Richard D.: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,512,361, Cl. 137-355.270.

Red Fox Industries, Inc.: *See*—
Dunham, David A.; Riggs, Robert P.; and Burton, Rufus L., Jr., 4,512,553, Cl. 254-89.00R.

Redshaw, Sally: *See*—
Attwood, Michael R.; Hassall, Cedric H.; Lambert, Robert W.; Lawton, Geoffrey; and Redshaw, Sally, 4,512,924, Cl. 260-243.300.

Reeber, Nicholas J.: *See*—
St. John, Karl M.; Reeber, Nicholas J.; and Kerbel, Sheldon J., 4,513,314, Cl. 358-76.000.

Reel, Jerry R.; and Cook, Clarence E., to Research Triangle Institute. Progrestationally active steroids. 4,512,986, Cl. 514-170.000.

Reese, Wayne S.: *See*—
Isham, Robert O.; and Reese, Wayne S., 4,512,048, Cl. 5-37.00R.

Regalbuto, John A.; Patton, James B.; and Sumner, Cyril R., to Halliburton Company. Mechanically initiated tubing conveyed perforator system. 4,512,418, Cl. 175-4.560.

Regeffe, Jean Y.: *See*—
Faure, Michel; Regeffe, Jean Y.; Lumineau, Yves; and Jouanin, Andre , 4,512,790, Cl. 65-13.000.

Rehfeld, Gerhard: *See*—
Kummer, Peter; and Rehfeld, Gerhard, 4,513,089, Cl. 501-103.000.

Rehklau, George D.; Cotterill, Lee A.; and Langevin, Robert Z., to Electro-Sound, Inc. Cassette loading apparatus. 4,512,527, Cl. 242-56.00R.

Reid, John H. Pumpless clarifier apparatus and process for operation thereof in combination with a draft tube circulator/aerator. 4,512,895, Cl. 210-627.000.

Reid, Lloyd E.; Yao, Keith C.; and Ryan, Douglas G., to Exxon Research and Engineering Co. Used oil re-refining. 4,512,878, Cl. 208-179.000.

Reinhardt, Bruce A.; Arnold, Fred E.; and Unroe, Marilyn R. Thermally stable phenylacetylene terminated arylether resins. 4,513,131, Cl. 526-285.000.

Reisem, Daniel E., to Minnesota Mining and Manufacturing Company. Momentary contact magnetic switch. 4,513,271, Cl. 335-205.000.

Reist, Walter; and Eberle, Jurg, to Ferag AG. Apparatus for transporting continuously arriving flat paper products, especially a stream of printed products arriving in an imbricated formation. 4,512,457, Cl. 198-479.000.

Reitze, Frederick T. Key holder. 4,512,168, Cl. 70-456.00R.

Remenicky, Joseph M., to Sargent & Greenleaf, Inc. Variable position quick mount combination lock. 4,512,167, Cl. 70-443.000.

Remond, Pierre: *See*—
Deborde, Albert H.; and Remond, Pierre, 4,512,375, Cl. 139-435.000.

Reneau, Daniel L.; Tzakis, George J.; and Engel, Christopher M., to Zenith Electronics Corporation. Non-linear peaking system. 4,513,320, Cl. 358-166.000.

Renfrew, Andrew H. M.: *See*—
Anderton, Kenneth; Hall, Nigel; Parton, Brian; Renfrew, Andrew H. M.; and Shaw, Malcolm G., 4,512,773, Cl. 8-657.000.

Rensink, Loman, to Hughes Aircraft Company. Multi-phase DC-to-AC and DC-to-DC boost converter. 4,513,361, Cl. 363-21.000.

Research Triangle Institute: *See*—
Reel, Jerry R.; and Cook, Clarence E., 4,512,986, Cl. 514-170.000.

Reslow, Leif F.; Nieman, Mark D.; and Swagert, Dean R., to Motter Printing Press Co. Foam ink fountain. 4,512,254, Cl. 101-157.000.

Resseguier, Jacques: *See*—
Dronet, Jean-Marc; and Resseguier, Jacques, 4,512,734, Cl. 425-305.100.

Restaurant Technology, Inc.: *See*—
Schindler, James C.; and Jewell, Donald K., 4,512,250, Cl. 99-425.000.

Revici, Emanuel; Sherwood, Bob E.; Benecke, Herman P.; Rice, John M.; and Geisler, Richard W., to Vinoxen Company, Inc., The. Virucidal compositions and therapy. 4,513,008, Cl. 514-560.000.

Rhoades, James J., to Tapco Products Company, Inc. Combined sheet bending brake and platform. 4,512,174, Cl. 72-319.000.

Ribbon Technology, Inc.: *See*—
Lankard, David R., 4,513,040, Cl. 428-49.000.

Ribes, Michel: *See*—
Carette, Brigitte; Kone, Ali; Souquet, Jean-Louis; Ribes, Michel; and Maurin, Maurice, 4,513,070, Cl. 429-193.000.

Rice, John M.: *See*—
Revici, Emanuel; Sherwood, Bob E.; Benecke, Herman P.; Rice, John M.; and Geisler, Richard W., 4,513,008, Cl. 514-560.000.

Richard, Michael A.: *See*—
Wright, Franklin J.; Richard, Michael A.; and Pirkle, James C., 4,513,104, Cl. 518-714.000.

Richard Wolf GmbH: *See*—
Falk, Ernst; and Knosel, Johann, 4,512,343, Cl. 128-303.170.

Richardson, Mark A.: *See*—
Fayerman, Jeffrey T.; and Richardson, Mark A., 4,513,086, Cl. 435-317.000.

Richardson, Ryden L.: *See*—
Angmorter, Paul K.; Simpson, Howard D.; and Richardson, Ryden L., 4,513,097, Cl. 502-211.000.

Richter, Robert E.: *See*—
Field, Harold; and Richter, Robert E., 4,513,068, Cl. 429-121.000.

Rickardsson, Gote: *See*—
Eriksson, Lars E.; and Rickardsson, Gote, 4,512,125, Cl. 52-209.000.

Ricoh Co., Ltd.: *See*—
Kubo, Keishi; and Kawamura, Eiichi, 4,513,052, Cl. 428-219.000.
Suzaki, Masayuki; and Kanno, Tetuo, 4,512,674, Cl. 400-208.000.

Ricoh Watch Co., Ltd.: *See*—
Kamiya, Kenji; and Hosoi, Masatoshi, 4,512,229, Cl. 84-1.010.

Rieben, Werner P.: *See*—
Wilson, William P.; Hewlett, Catherine M.; and Rieben, Werner P., 4,513,379, Cl. 364-474.000.

Rieber, Norbert; Platz, Rolf; and Jung, Johann, to BASF Aktiengesellschaft. Norbornane compounds, plant growth regulators containing these compounds, and their intermediates. 4,512,795, Cl. 71-88.000.

Rigby, Eugene B., to International Business Machines Corporation. Method of making a thin film insulator. 4,512,862, Cl. 204-192.00D.

Riggle, Rita C. Toilet guard. 4,512,046, Cl. 4-661.000.

Riggs, John F. Electrostud. 4,512,129, Cl. 52-364.000.

Riggs, Robert P.: *See*—
Dunham, David A.; Riggs, Robert P.; and Burton, Rufus L., Jr., 4,512,553, Cl. 254-89.00R.

Right, Robert W., to General Signal Corporation. Console priority control. 4,513,284, Cl. 340-825.510.

Ring, Michael: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,512,849, Cl. 162-157.200.

Ringold, Howard J.: *See*—
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,512,990, Cl. 514-225.000.

Ritchie, Robert S.: *See*—
Bunker, James W.; and Ritchie, Robert S., 4,512,678, Cl. 403-15.000.

Ritke, Harold A.; and Ritke, Randal G. Chlorine injector for treatment of effluent. 4,512,887, Cl. 210-220.000.

Ritke, Randal G.: *See*—
Ritke, Harold A.; and Ritke, Randal G., 4,512,887, Cl. 210-220.000.

Ritter, Christoph: *See*—
Marsoner, Hermann; Ritter, Christoph; Kleinhappl, Erich; and Strutz, Winfried, 4,512,953, Cl. 422-67.000.

Ritter, George W., II, to Owens-Corning Fiberglas Corporation. Sol-gel solution preparation. 4,512,913, Cl. 252-313.100.

Rival Manufacturing Company: *See*—
Chappell, William A.; Tweed, William J.; and Higgins, David T., 4,512,246, Cl. 99-312.000.

Rizvi, Syed S. H.; and Gossett, Patricia W., to Cornell Research Foundation, Inc. Gelation measuring apparatus and method. 4,512,182, Cl. 73-64.100.

Robbins, John D., to North American Philips Consumer Electronics Corp. CRT Internal shielding means for a spun glass envelope funnel section. 4,513,221, Cl. 313-402.000.

Robert Bosch GmbH: *See*—
Babitzka, Rudolf; Haag, Gottlob; and Linder, Ernst, 4,512,452, Cl. 192-104.00C.
Gast, Theodor; Kubach, Hans; and Binder, Kurt, 4,512,549, Cl. 251-137.000.
Heitmann, Jurgen, 4,513,328, Cl. 360-8.000.
Hofer, Gerald; Straubel, Max; and Eheim, Franz, 4,512,308, Cl. 123-383.000.
Poetsch, Dieter; Massmann, Volker; Becker, Werner; and Wagner, Horst, 4,513,324, Cl. 358-214.000.

Robert Linkletter Associates, Inc.: *See*—
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,512,485, Cl. 215-225.000.

Roberts, Thomas G.; and Honeycutt, Thomas E., to United States of America, Army. Erectable large optic for outer space application. 4,512,639, Cl. 350-418.000.

Robertson, James P.: *See*—
Day, Gary L.; and Robertson, James P., 4,513,123, Cl. 525-332.600.

Robinson, John W.; and Kaganowicz, Grzegorz, to RCA Corporation. Glow discharge apparatus for use in coating a disc-shaped substrate. 4,512,284, Cl. 118-723.000.

Robinson, Lee F.; Salimbeni, Francesco; Porcari, Guiliano; and Dente, Mario. Digester. 4,512,956, Cl. 422-270.000.

Robinson, Marquis B.: *See*—
Boysen, Gerd C.; Murray, Patrick S.; and Robinson, Marquis B., 4,513,181, Cl. 200-50.00C.

Robinson, Mary K.; and Probst, Timothy F., to Figgie International. Universal type packing head. 4,512,134, Cl. 53-248.000.

Robson, Michael J., to Imperial Chemical Industries PLC. Insecticidal product and preparation thereof. 4,512,931, Cl. 260-465.00D.

Rocha, Henry A. F., to General Electric Company. Current-squared-time (I^2t) protection system. 4,513,342, Cl. 361-94.000.

Roche, John N., to American Sterilizer Company. Cable failure indicator. 4,512,106, Cl. 49-445.000.

Rocket Research Company: *See*—
Galbraith, Lyle D., 4,512,355, Cl. 137-68.00A.

Rockwell International Corporation: *See*—
Brown, James L., 4,513,307, Cl. 357-42.000.
Cascini, Michael R., 4,512,697, Cl. 411-7.000.
Frerking, Marvin E., 4,513,259, Cl. 331-176.000.
Hackett, Charles M., Jr., 4,513,383, Cl. 364-517.000.

Rodriguez, Larry A.; Padilla, Antonio A.; and Spake, Ned B. Power transformer waste heat recovery system. 4,512,387, Cl. 165-1.000.

Roeder, Allan W., to United States of America, Air Force. Simultaneous detection of time coincident signals in an adaptive doppler tracker. 4,513,428, Cl. 375-120.000.

Roeder, Allan W., to United States of America, Air Force. Sample data phase locked loop for adaptive doppler tracker. 4,513,429, Cl. 375-120.000.

Roettgen, Leslie A.: *See*—
DeVore, James R.; and Roettgen, Leslie A., 4,512,300, Cl. 123-196.0AB.

Roger, Harry. High and low pressure sensor. 4,512,370, Cl. 137-625.660.

Rogers, Frank S. Arc metal spray apparatus and method. 4,512,513, Cl. 239-8.000.

Rogers, Tommie: *See*—
Callegari, Stephen R., Sr.; and Rogers, Tommie L., 4,512,216, Cl. 81-57.170.

Rogers, Tommie L.: *See*—
Callegari, Stephen R., Sr.; and Rogers, Tommie L., 4,512,216, Cl. 81-57.170.

Rohm GmbH: *See*—
Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, 4,513,118, Cl. 525-81.000.

Rohm GmbH Chemische Fabrik: *See*—
Kaube, Peter; Schanz, Karl-Heinz; Vetter, Heinz; and Muller, Jens, 4,513,048, Cl. 428-188.000.

Rohr, Gunter H., to Union Special GmbH. Method and apparatus for tensioning and sewing a tubular workpiece. 4,512,268, Cl. 112-63.000.

Romanelli, Pat: *See*—
Kozam, George; and Romanelli, Pat, 4,512,769, Cl. 604-209.000.

Romano, Ugo, to ANIC, S.p.A. Process for synthesizing carbonic acid esters derived from unsaturated alcohols and polyhydric alcohols. 4,512,930, Cl. 260-463.000.

Romanov, Anatoly A.: *See*—
Andreev, Anatoly A.; and Romanov, Anatoly A., 4,512,867, Cl. 204-298.000.

Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie, to Societe Civile Bioprojet. Aminoacid derivatives and their therapeutic applications. 4,513,009, Cl. 514-513.000.

Roquet, Francoise: *See*—
Joannic, Michel; Roquet, Francoise; and Pesson, Marcel, 4,513,001, Cl. 514-394.000.

Roquette Freres: *See*—
Lumaret, Jean-Claude; Gosset, Serge; and Huchette, Michel, 4,512,915, Cl. 252-389.00A.

Rose, Allan F., to Chevron Research Company. Phenoxyalkenylpyridine derivatives and fungicidal methods of use. 4,512,995, Cl. 514-277.000.

Rosenbaum, Georges: *See*—
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,513,011, Cl. 514-730.000.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Phenols and use thereof as stabilizers. 4,513,109, Cl. 524-342.000.

Rosencwaig, Allan, to Therma-Wave, Inc. Thin film thickness measurements and depth profiling utilizing a thermal wave detection system. 4,513,384, Cl. 364-563.000.

Ross, William J.: *See*—
Baker, Stephen R.; Jamieson, William B.; Ross, William J.; and Todd, Alec, 4,513,005, Cl. 514-451.000.

Rossmann, Axel, to Motoren-un Turbinen-Union Munchen GmbH. Hot gas wetted turbine blade. 4,512,719, Cl. 416-241.00B.

Rote, George B.: *See*—
Hitchens, Max W.; and Rote, George B., 4,512,747, Cl. 434-428.000.

Rothenberger, Robert: *See*—
Hulett, John G.; and Rothenberger, Robert, 4,512,830, Cl. 156-70.000.

Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A., 4,512,353, Cl. 131-304.000.

Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,513,139, Cl. 546-196.000.
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,513,147, Cl. 562-506.000.
Meier, Jean; and Clemence, Francois, 4,512,997, Cl. 514-383.000.

Rowley, David S.; and Aumann, James T., to Christensen, Inc. Coring device with an improved core sleeve and anti-gripping collar. 4,512,419, Cl. 175-58.000.

Rowley, James R.: *See*--
Thomaswick, Ronald J.; and Rowley, James R., 4,512,473, Cl. 206-454.000.

Rubio, Manuel J. Continuous production of corn products. 4,513,018, Cl. 426-622.000.

Ruckman, James A.: *See*—
Keesee, Kenneth C.; and Ruckman, James A., 4,512,132, Cl. 52-742.000.

Ruh, Wolf-Dieter: *See*—
Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, 4,512,847, Cl. 156-626.000.

Ruhrkohle Aktiengesellschaft: *See*—
Mosebach, Wilhelm, 4,512,850, Cl. 201-1.000.

Runge, Peter K., to AT&T Bell Laboratories. Optical fiber connector. 4,512,630, Cl. 350-96.210.

Runkle, Dean E.; and Colpaert, James J., to Bendix Corporation, The. Adjustment assembly for a disc brake. 4,512,445, Cl. 188-71.900.

Ruoff, Carl F., Jr., to United States of America, National Aeronautics and Space Administration. Retinally stabilized differential resolution television display. 4,513,317, Cl. 358-133.000.

Russell, Steven J.: *See*—
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,512,319, Cl. 123-492.000.

Russo, Carl J.: *See*—
Liebert, Reuel B.; and Russo, Carl J., 4,512,812, Cl. 134-21.000.

Russtech Engineering Company, Inc.: *See*—
Fieberg, Russell F.; and Fieberg, Donald E., 4,512,071, Cl. 29-278.000.

Ruth, John V.; and Potts, Garfield C., to Ultra Mileager Company, Inc. Carburetor vaporizer. 4,512,323, Cl. 123-557.000.

Rutledge, Raleigh N.: *See*—
Hahn, Granville J.; and Rutledge, Raleigh N., 4,512,395, Cl. 165-101.000.
Hahn, Granville J.; and Rutledge, Raleigh N., 4,512,943, Cl. 264-173.000.

Rux, Paul R. Pet seat for automobiles. 4,512,286, Cl. 119-96.000.

Ryan, Douglas G.: *See*—
Reid, Lloyd E.; Yao, Keith C.; and Ryan, Douglas G., 4,512,878, Cl. 208-179.000.

Ryczek, Lawrence J., to Eaton Corporation. Short circuit protector having fold-back trip point for solid state switching device. 4,513,343, Cl. 361-101.000.

Ryobi Limited: *See*—
Tunoda, Kikuo, 4,512,531, Cl. 242-84.21R.

Ryono, Denis E.: *See*—
Weller, Harold N., III; Gordon, Eric M.; Karanewsky, Donald S.; and Ryono, Denis E., 4,512,988, Cl. 514-211.000.

Saab-Scania AB: *See*—
Parsson, Nils O., 4,512,609, Cl. 297-331.000.

Saben, Hugh S.: *See*—
Coulthard, T. Lionel; Townsley, Phillip M.; and Saben, Hugh S., 4,512,103, Cl. 47-1.100.

Safety Cross Mirror Co., Inc.: *See*—
Stout, Thomas R., 4,512,634, Cl. 350-632.000.

Safiuddin, Mohammed, to Westinghouse Electric Corp. General purpose and optimal length controller for cyclic duty motor drives. 4,513,232, Cl. 318-341.000.

St. John, Karl M.; Reeber, Nicholas J.; and Kerbel, Sheldon J., to Hazeltine Corporation. Ink usage estimator. 4,513,314, Cl. 358-76.000.

Saito, Akio: *See*—
Uchigaki, Takatoshi; Saito, Akio; and Yamada, Naoki, 4,512,348, Cl. 128-632.000.

Saito, Isao: *See*—
Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; Saito, Isao; and Kitoh, Kyosuke, 4,513,145, Cl. 549-402.000.

Saito, Susumu: *See*—
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.

Sakai, Masayuki: *See*—
Watanabe, Toshimitu; Sakai, Masayuki; Minami, Kazutoshi; and Takumi, Shigeji, 4,512,239, Cl. 98-2.030.

Sakai, Shinji: *See*—
Kinoshita, Takao; and Sakai, Shinji, 4,513,313, Cl. 358-44.000.

Sakai, Takaaki, to Osaka Suda Co. Ltd. Sea water antifouling method. 4,513,029, Cl. 427-204.000.

Sakamoto, Seiichi; and Terauchi, Kiyoshi, to Sanden Corporation. Drive bearing device for a fluid displacement apparatus. 4,512,729, Cl. 418-55.000.

Sakamoto, Toshiyuki; and Wataya, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Fuel control apparatus for an internal combustion engine. 4,512,314, Cl. 123-459.000.

Sakanoue, Kei; and Aoki, Kozo, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 4,513,079, Cl. 430-502.000.

Sakato, Keiichiro, to Nippon Kogaku K.K. Exposure control system. 4,512,657, Cl. 355-68.000.

Sakoe, Hiroaki; and Chiba, Seibi, to Nippon Electric Co., Ltd. System operable as an automaton for recognizing continuously spoken words with reference to demi-word pair reference patterns. 4,513,435, Cl. 381-41.000.

Sakurada, Nobuaki: *See*—
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, 4,512,656, Cl. 354-475.000.

Sakurada, Satoshi; Hashimoto, Takao; Tagaya, Nobuaki; Maeshima, Tsugio; Ueda, Kayako; and Kokubo, Masahiro, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the low polymerization of isobutene. 4,513,166, Cl. 585-832.000.

Sakurai, Shigeru; and Hamada, Shigeki, to Mazda Motor Corporation. Exhaust gas purifying device. 4,512,786, Cl. 55-282.000.

Salimbeni, Francesco: *See*—
Robinson, Lee F.; Salimbeni, Francesco; Porcari, Guiliano; and Dente, Mario, 4,512,956, Cl. 422-270.000.

Salvagnini, Guido, to Salvagnini Transferica S.p.A. Apparatus for the automatic shearing of a sheet metal in several pieces of different size. 4,512,227, Cl. 83-104.000.

Salvagnini Transferica S.p.A.: *See*—
Salvagnini, Guido, 4,512,227, Cl. 83-104.000.

SAME S.p.A.: *See*—
Pitozzi, Luigi, 4,512,305, Cl. 123-364.000.

Sanden Corporation: *See*—
Sakamoto, Seiichi; and Terauchi, Kiyoshi, 4,512,729, Cl. 418-55.000.

Sanders Associates, Inc.: *See*—
Sebestyen, George; Sinclair, Ronald R.; Smith, John A.; Sands, Timothy B.; and Nussdorfer, Theodore J., 4,512,537, Cl. 244-3.210.
Smades, Jack E., 4,513,043, Cl. 428-113.000.
Westly, Pernie E.; and Leder, Uri, 4,512,505, Cl. 226-101.000.

Sandrik, John M.; and Pelc, Norbert J., to General Electric Company. Film-based dual energy radiography. 4,513,078, Cl. 430-496.000.

Sandrin, Romedio, to Snamprogetti S.p.A. Integrated process for producing tert.butyl alkyl ethers and butene-1. 4,513,153, Cl. 568-697.000.

Sands, Timothy B.: *See*—
Sebestyen, George; Sinclair, Ronald R.; Smith, John A.; Sands, Timothy B.; and Nussdorfer, Theodore J., 4,512,537, Cl. 244-3.210.

Sandy Hill Corporation: *See*—
Juckett, David W., 4,512,226, Cl. 83-56.000.

Sano, Hiroshi: *See*—
Komiyama, Noboru; Itoi, Hiroshi; and Sano, Hiroshi, 4,512,968, Cl. 424-48.000.

Sano, Yoshiaki, to Fujitsu Limited. Active load circuit. 4,513,252, Cl. 330-257.000.

Santangelo, Joseph G.; and Fernbacher, John M., to Air Products and Chemicals, Inc. In situ coal gasification. 4,512,403, Cl. 166-261.000.

Santoni, Cesar, to Greif Bros. Corporation. Nesting drums-method of making the same. 4,512,700, Cl. 413-4.000.

Santrade Ltd.: *See*—
Bylund, Sven O., 4,512,689, Cl. 407-40.000.

Santucci, Edward A.; and Racz, William B., to Johnson & Johnson Dental Products Company. Method for masking discoloration on teeth. 4,512,743, Cl. 433-217.000.

Saravis, Darren S.: *See*—
Saravis, Lawrence M., deceased; Stein, Jeffrey A.; and Saravis, Darren S., 4,512,617, Cl. 308-6.00C.

Saravis, Lawrence M., deceased (by Saravis, Nancy, executrix); Stein, Jeffrey A.; and Saravis, Darren S., to Barden Corporation, The. Linear ball bearing which accommodates shaft misalignment. 4,512,617, Cl. 308-6.00C.

Saravis, Nancy, executrix: *See—*
Saravis, Lawrence M., deceased; Stein, Jeffrey A.; and Saravis, Darren S., 4,512,617, Cl. 308-6.00C.

Sargent & Greenleaf, Inc.: *See—*
Remenicky, Joseph M., 4,512,167, Cl. 70-443.000.

Sarh, Branko; and Pasenau, Hartmut, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for making a surface type structural component, especially for aircraft. 4,512,837, Cl. 156-189.000.

Sasaki, Gen, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device utilizing selective oxidation and diffusion from a polycrystalline source. 4,512,074, Cl. 29-576.00W.

Sasaya, Hideaki: *See—*
Nakano, Hiromichi; Sasaya, Hideaki; Inagaki, Mitsuo; Matsui, Kazuma; and Yoshimura, Kunimasa, 4,512,728, Cl. 418-3.000.

Sato, Fumitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Information processing system. 4,513,369, Cl. 364-200.000.

Sato, Jun, to Shimano Industrial Company Limited. Fishing reel. 4,512,536, Cl. 242-218.000.

Sato, Katsuharu: *See—*
Nomura, Susumu; and Sato, Katsuharu, 4,513,408, Cl. 369-46.000.

Sato, Kazusuke: *See—*
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,512,557, Cl. 266-171.000.

Sato, Yasumasa: *See—*
Kishida, Kazuo; Yamamoto, Naoki; Nishida, Kozi; Narita, Toshihito; and Sato, Yasumasa, 4,513,111, Cl. 524-458.000.

Sato, Yoshitaka: *See—*
Hirata, Mitsuki; Sato, Yoshitaka; and Matudaira, Kaname, 4,512,413, Cl. 172-74.000.

Satosen Co., Ltd.: *See—*
Ohta, Hideo; Hakuzen, Tatuzo; Ito, Yasunori; and Takagi, Fusao, 4,512,829, Cl. 156-659.100.

Saulgeot, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Rotary vacuum pump. 4,512,725, Cl. 417-366.000.

Saurer Diederichs Societe Anonyme: *See—*
Deborde, Albert H.; and Remond, Pierre, 4,512,375, Cl. 139-435.000.

Savage, Garry, to Institut de Recherche en Sante et en Securite du Travail du Quebec. Safety vest. 4,512,437, Cl. 182-3.000.

Sawada, Seigo: *See—*
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,513,138, Cl. 546-48.000.

Scandpower, Inc.: *See—*
Smith, Robert D., 4,512,949, Cl. 376-247.000.

Schaad, Walter; and Kull, Peter, to Sprecher & Schuh AG. High-voltage circuit breaker including cut-on resistor. 4,513,187, Cl. 200-144.0AP.

Schafer, Reinhard: *See—*
Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, 4,512,939, Cl. 264-0.500.

Schainker, Robert B.: *See—*
Cohn, Arthur; and Schainker, Robert B., 4,512,715, Cl. 415-168.000.

Schaller, Helmut F. K. Tremolo tailpiece and bridge device. 4,512,232, Cl. 84-313.000.

Schantz, Christopher A.: *See—*
Hanson, Eric G.; Hiskes, Ronald; and Schantz, Christopher A., 4,512,629, Cl. 350-96.300.

Schanz, Karl-Heinz: *See—*
Kaube, Peter; Schanz, Karl-Heinz; Vetter, Heinz; and Muller, Jens, 4,513,048, Cl. 428-188.000.

Schaub, Clyde D.: *See—*
Cegielski, John M., Jr.; Campbell, Gerald D.; and Schaub, Clyde D., 4,512,267, Cl. 110-347.000.

Scherf, Thomas W.: *See—*
La Barge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,512,253, Cl. 100-53.000.

Schering Corporation: *See—*
Nafissi-Varchei, M.Mehdi, 4,512,998, Cl. 514-367.000.

Scherl, Wolfgang, to Siemens Aktiengesellschaft. Method for locating and circumscribing text areas on a master which may contain text, graphics and/or image areas. 4,513,442, Cl. 382-49.000.

Scherzer, Julius; and Humphries, Adrian P., to Harshaw/Filtrol. Dealumination of faujasite-type zeolites using ion exchange resins. 4,512,961, Cl. 423-328.000.

Scheu, Friedrich, to Hewlett-Packard Company. Thermal ink jet printhead. 4,513,298, Cl. 346-140.00R.

Schick, Rupert: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,513,105, Cl. 521-56.000.

Schiessl, Henry W., to Olin Corporation. Use of a hydroquinone compound with hydrazine (1:1 molar ratio) as an oxygen-scavenging and a corrosion-inhibiting agent. 4,512,909, Cl. 252-188.280.

Schillawski, Richard D., to Stauffer Chemical Company. Chloral purification. 4,513,152, Cl. 568-492.000.

Schindler, James C.; and Jewell, Donald K., to Restaurant Technology, Inc. Apparatus for cooking eggs. 4,512,250, Cl. 99-425.000.

Schindler, Manfred: *See—*
Ficht, Reinhold; and Schindler, Manfred, 4,512,290, Cl. 123-56.0BC.

Schindlery, Ctibor, to Ciba-Geigy Corporation. New pharmaceutical preparations. 4,512,987, Cl. 514-171.000.

Schlaikjer, Carl R.: *See—*
Kuo, Han C.; Foster, Donald L.; Schlaikjer, Carl R.; Gopikanth, Mysore L.; and Dey, Arabinda N., 4,513,067, Cl. 429-101.000.

Schlicht, Raymond C.; and Skrobul, Anthony P., to Texaco Inc. Lubricant compositions containing amides of hydroxy-substituted aliphatic acids and fatty amines. 4,512,903, Cl. 252-51.50A.

Schlig, Eugene S.: *See—*
Chamberlain, Savvas G.; and Schlig, Eugene S., 4,513,431, Cl. 377-60.000.

Schlumberger Technology Corporation: *See—*
Barber, Thomas D., 4,513,376, Cl. 364-422.000.
Sinha, Bikash K.; and Gouilloud, Michel, 4,512,198, Cl. 73-703.000.

Schmidle, Claude J., to Morton Thickol, Inc. Photocurable compositions. 4,512,910, Cl. 252-188.310.

Schmidt, Erich, to MZW Maschinenfabrik Zuckermann Pachtgesellschaft mbH. Apparatus for the transverse and/or longitudinal machining of wooden workpieces. 4,512,380, Cl. 144-1.00A.

Schmidt-Ruppin, Karl H., to Kureha Chemical Industry Co., Ltd. Nasal preparation and processes for their production. 4,512,972, Cl. 424-89.000.

Schmitt, Walter; and Michel, Dieter, to Dr. Johannes Heidenhain GmbH. Measuring apparatus. 4,512,083, Cl. 33-143.00L.

Schmitz, Willard H.: *See—*
Striegel, William H.; and Schmitz, Willard H., 4,512,042, Cl. 4-496.000.

Schneider, Barbara, to Gamma Medical Products, Inc. Method and apparatus for selective removal of constituents of blood. 4,512,763, Cl. 604-5.000.

Schneider, Egon, to Krones AG Herman Kronseder Maschinenfabrik. Labeling machine. 4,512,842, Cl. 156-357.000.

Schneider, Egon: *See—*
Losel, Georg; and Schneider, Egon, 4,512,785, Cl. 55-204.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lee, Seok-Ho, 4,512,925, Cl. 260-397.200.

Schofield, John; and Milsom, Robert F., to U.S. Philips Corporation. Acoustic surface wave device. 4,513,262, Cl. 333-194.000.

Scholz, John A.: *See—*
Labadini, William M.; and Scholz, John A., 4,513,227, Cl. 315-290.000.

Schoonover, Kevin G., to Steam Systems and Services, Incorporated. Dual element desuperheater apparatus. 4,512,520, Cl. 239-440.000.

Schriber, Louis; Stephens, Robert E.; and Blaha, John F., to Harris Graphics Corporation. Business forms press. 4,512,256, Cl. 101-248.000.

Schroder, Ernst F., to Licentia Patent-Verwaltungs-GmbH. Electronic amplifier having a transmission factor that is variable by means of a controllable voltage, specifically an expander. 4,513,253, Cl. 330-278.000.

Schroeder, Jack A.; and Winkler, Ernel R., to Motorola, Inc. Metallization and bonding means and method for VLSI packages. 4,513,355, Cl. 361-403.000.

Schroeder, Roberto: *See—*
Nielsen, Hans C. A.; and Schroeder, Roberto, 4,512,809, Cl. 106-103.000.

Schuller, James T.; Griner, Paul K.; and Mak, Nai H., to UMC Industries, Inc. Vendor accountability system. 4,512,453, Cl. 194-1.00N.

Schuller, James T.; Smith, Barry L.; and Griner, Paul K., to UMC Industries, Inc. Coin apparatus having coin escrow and return means. 4,512,454, Cl. 194-1.00D.

Schulthess, Adrian: *See—*
de Courten, Alfred; Schulthess, Adrian; and Esteve-Soler, Jose , 4,513,007, Cl. 514-555.000.

Schulz, Gunter: *See—*
Hartmannsgruber, Max; Kriechbaum, Kurt; Schulz, Gunter; and Guttler, Hermann, 4,512,061, Cl. 19-239.000.

Schumacher, Thomas H.: *See—*
Alverth, Ronald W.; and Schumacher, Thomas H., 4,512,564, Cl. 271-274.000.

Schwartz, Jean-Charles: *See—*
Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie, 4,513,009, Cl. 514-513.000.

Schwartz, Marie A., legal representative: *See—*
Schwartz, Sidney J., deceased, 4,513,396, Cl. 365-6.000.

Schwartz, Sidney J., deceased (by Schwartz, Marie A., legal representative), to Burroughs Corporation. Method of operating a magnetic bubble memory with a drive field that temporarily stops. 4,513,396, Cl. 365-6.000.

Schwarz, Carl E.: *See—*
Fischer, Paul M.; and Schwarz, Carl E., 4,512,882, Cl. 210-86.000.

Schwenk, Tyrone D., to United States of America, Army. Sealing tubulation and method. 4,512,488, Cl. 220-2.200.

Scientific Technology, Ltd.: *See—*
Jacobstein, Benjamin, 4,512,601, Cl. 294-1.200.

SCM Corporation: *See—*
Abbey, Kirk J.; Erickson, James R.; and Kunz, Barbara L., 4,512,860, Cl. 204-181.00C.

Scott, Dale K.; and Calvert, Rodney K., to Mead Corporation, The. Locking mechanism for wrap-around cartons. 4,512,135, Cl. 53-285.000.

Scranton, Robert A.: *See—*
Chainer, Timothy J.; Scranton, Robert A.; and Worthington, Thomas K., 4,513,437, Cl. 382-3.000.

Scrymgeour, Andrew H.: *See—*
Gilbert, Clark J.; Hassialis, Menelaos D.; Scrymgeour, Andrew H.; and Vera, Samuel I., 4,512,610, Cl. 299-13.000.

Sebestyen, George; Sinclair, Ronald R.; Smith, John A.; Sands, Timothy B.; and Nussdorfer, Theodore J., to Sanders Associates, Inc. Canard control assembly for a projectile. 4,512,537, Cl. 244-3.210.
Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdon of Great Britian and Northern Ireland of Whitehall, The: *See—*
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,512,636, Cl. 350-350.00R.
Seegmiller, Dennis F.: *See—*
Lefevre, Donald K.; Dennis, Patrick W.; and Seegmiller, Dennis F., 4,513,290, Cl. 343-745.000.
Seely, James R., to Marketing Displays, Inc. Plastic poster frame with articulated bias member. 4,512,094, Cl. 40-156.000.
Seely, James R., to Marketing Displays, Inc. Hinged plastic biased poster frame. 4,512,095, Cl. 40-156.000.
Seiter, Charles R.: *See—*
Blevins, Milton L.; and Seiter, Charles R., 4,512,178, Cl. 72-393.000.
Seitz, Charles L.; Grunewald, Paul; Parker, Marshall M.; and Stafford, Irvin G., to Burroughs Corporation. Video Synthesizer for a digital video display system employing a plurality of grayscale levels displayed in discrete steps of luminance. 4,513,278, Cl. 340-347.0DA.
SEITZ ENZINGER NOLL Maschinenbau Aktiengesellschaft: *See—*
Binnig, Rupert; Gerlach, Gunter; Nilles, Peter; and Pankatz, Jurgen, 4,512,811, Cl. 134-10.000.
Seminski, Robert B.: *See—*
Feitzinger, Eduard; and Seminski, Robert B., 4,512,654, Cl. 355-27.000.
Semperit Aktiengesellschaft: *See—*
Waniek, Kurt; and Tichy, Heinz, 4,513,046, Cl. 428-156.000.
Sendzimir, Tadeusz. Continuous spray casting. 4,512,384, Cl. 164-46.000.
Sentrol, Inc.: *See—*
Abel, William E., 4,513,354, Cl. 361-399.000.
Seppelt, Wolfgang: *See—*
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,512,984, Cl. 514-147.000.
SEPPIC: *See—*
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Sepulveda, Domingo: *See—*
Striebel, Edmund E.; Matthews, John A.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,512,158, Cl. 60-740.000.
Servadio, Robert. Punching bag rebound adjuster. 4,512,568, Cl. 272-78.000.
SerVend International, Inc.: *See—*
Landers, Jerry L., 4,512,502, Cl. 222-413.000.
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Difluoromethoxyphenyl thiophosphates as pesticides. 4,512,984, Cl. 514-147.000.
Sexton, John M., to Pressure Systems, Inc. Air purification system monitor. 4,512,191, Cl. 73-337.500.
Seymour, Raymond K.; Palmieri, Joseph M.; Ashline, William J.; and Doughty, Dennis J., to General Electric Company. Automated Q-line circuit breaker. 4,513,268, Cl. 335-35.000.
Sferra, James P.: *See—*
Ready, Robert J.; Whipple, Donald E.; and Sferra, James P., 4,512,098, Cl. 40-610.000.
Shah, Dhiraj M.: *See—*
Balko, Alexander B.; and Shah, Dhiraj M., 4,512,338, Cl. 128-1.00R.
Shanel, Kathleen A. Holder for rubber dental dam. 4,512,742, Cl. 433-136.000.
Sharkness, James E.: *See—*
Macur, George J.; Pratt, W. Robert; and Sharkness, James E., 4,512,900, Cl. 210-748.000.
Sharp, Charles C.: *See—*
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Sharp, David G.: *See—*
Moran, David P. J.; and Sharp, David G., 4,513,017, Cl. 426-603.000.
Shaw, Gerard J.: *See—*
Mehrotra, Deepak; Shaw, Gerard J.; Go, Jok Y.; and Kant, Rajni, 4,512,076, Cl. 29-578.000.
Shaw, Malcolm G.: *See—*
Anderton, Kenneth; Hall, Nigel; Parton, Brian; Renfrew, Andrew H. M.; and Shaw, Malcolm G., 4,512,773, Cl. 8-657.000.
Shea, Donald M.: *See—*
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Sheets, Duane R., to Electronic Data Systems Corporation. Local area network. 4,513,373, Cl. 364-200.000.
Sheinbaum, Itzhak. Flowing geothermal wells and heat recovery systems. 4,512,155, Cl. 60-641.200.
Shell Oil Company: *See—*
Kieffer, Eduard P.; and Sie, Swan T., 4,512,877, Cl. 208-136.000.
Shenk, William H., to Honeywell Information Systems Inc. Method and apparatus for generating a repetitive serial pattern using a recirculating shift register. 4,513,392, Cl. 364-900.000.
Shepherd, Thomas I.: *See—*
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Sheppard, William D.: *See—*
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Sherwood, Bob E.: *See—*
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Shibamoto, Takeshi: *See—*
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; and Tanaka, Koji, 4,513,327, Cl. 358-310.000.
Shibata, Shin; Aoyama, Akira; and Mino, Tetsuya, to Kabushiki Kaisha Suwa Seikosha. Magnetic head for perpendicular magnetization recording. 4,513,337, Cl. 360-121.000.
Shibuya, Fukashi: *See—*
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Shigaki, Masanobu, to Kabushiki Kaisha Takuma. City refuse incinerator for the prevention of clinker formation. 4,512,266, Cl. 110-204.000.
Shigeki, Kiyoshi; and Maeno, Kunio, to Toyoda Gosei Co., Ltd. Colored weather strip. 4,513,044, Cl. 428-122.000.
Shigemizu, Akihiko, to Takachiho Kogyo Yuugen Kaisha; and Kabushiki Kaisha Kansai Kougu Seisakusho. Crusher for concrete structures. 4,512,524, Cl. 241-101.700.
Shigihara, Shigeyuki; and Tadokoro, Masahiro, to Shinko Electric Co. Ltd. Apparatus for and method of desulfurizing and heating molten metal. 4,512,801, Cl. 75-58.000.
Shimano Industrial Company Limited: *See—*
Sato, Jun, 4,512,536, Cl. 242-218.000.
Shimazaki, Hiroshi: *See—*
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,512,893, Cl. 210-500.200.
Shinko Electric Co. Ltd.: *See—*
Shigihara, Shigeyuki; and Tadokoro, Masahiro, 4,512,801, Cl. 75-58.000.
Shino, Kunihiko; and Matoba, Tamiji. Method for making a sanitary drink. 4,512,983, Cl. 424-195.100.
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Ito, Fumio; and Murakami, Hiroyashu, to Canon Kabushiki Kaisha. Camera system. 4,512,656, Cl. 354-475.000.
Shioya, Yoshimi: *See—*
Miyamoto, Hidekazu; Shioya, Yoshimi; Maeda, Mamoru; and Takagi, Mikio, 4,513,026, Cl. 427-85.000.
Shipley Company Inc.: *See—*
Valayil, Silvester; Abu-Moustafa, Magda; and Benjamin, Terry A., 4,512,818, Cl. 148-6.14R.
Shiraishi, Hiroshi: *See—*
Isobe, Asao; Makino, Daisuke; and Shiraishi, Hiroshi, 4,513,077, Cl. 430-270.000.
Shirck, James R.: *See—*
Jeffrey, Frank R., III; and Shirck, James R., 4,513,073, Cl. 430-65.000.
Shire, Steven J.: *See—*
Jones, Andrew J. S.; Olson, Kenneth C.; and Shire, Steven J., 4,512,922, Cl. 260-112.00R.
Shlichta, Paul J., to United States of America, National Aeronautics and Space Administration. Method for growth of crystals by pressure reduction of supercritical or subcritical solution. 4,512,846, Cl. 156-623.00Q.
Shofner, Frederick M., to ppm, Inc. Apparatus and methods for aeromechanical and electrodynamic release and separation of foreign matter from fiber. 4,512,060, Cl. 19-200.000.
Shoji, Fusaji; Takemoto, Issei; Kataoka, Fumio; Yokono, Hitoshi; and Isogai, Tokio, to Hitachi, Ltd. Heat-resistant silicone block polymer. 4,513,132, Cl. 528-21.000.
Shop-Vac Corporation: *See—*
Berfield, Robert C., 4,512,713, Cl. 415-119.000.
Shroot, Braham: *See—*
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,513,011, Cl. 514-730.000.
Maignan, Jean; and Shroot, Braham, 4,512,985, Cl. 514-301.000.
Shumway, Earl D.: *See—*
Shumway, Merwin S.; and Shumway, Earl D., 4,512,881, Cl. 209-270.000.
Shumway, Merwin S.; and Shumway, Earl D. Machine for recovering precious metal values from ore. 4,512,881, Cl. 209-270.000.
Sidline, George B., to Elkus, Eugene S. Magnetic card read-out and timing circuitry. 4,513,199, Cl. 235-449.000.
Sie, Swan T.: *See—*
Kieffer, Eduard P.; and Sie, Swan T., 4,512,877, Cl. 208-136.000.
Sieben, Joannes H. F. C., to U.S. Philips Corporation. Storage case for a magnetic-tape cassette. 4,512,470, Cl. 206-387.000.
Siegel, Hardo: *See—*
Fischer, Rolf; Weitz, Hans-Martin; and Siegel, Hardo, 4,513,150, Cl. 568-385.000.
Sieling, Frederick W.: *See—*
Bondoc, Alfredo A.; Flood, Eugene J.; and Sieling, Frederick W., 4,513,045, Cl. 428-137.000.
Siemens Aktiengesellschaft: *See—*
Barre, Claude, 4,513,210, Cl. 307-455.000.
Scherl, Wolfgang, 4,513,442, Cl. 382-49.000.
Siemens-Allis, Inc.: *See—*
Farag, Samir F.; Allen, Edgar W.; and Little, Thomas R., 4,513,180, Cl. 200-50.00R.
McClellan, David P.; and Kussy, Frank W., 4,513,267, Cl. 335-16.000.
Siemens Gammasonics, Inc.: *See—*
Domnanovich, James R.; and Erwin, William D., 4,513,204, Cl. 250-496.100.
Sigel, Carl W.: *See—*
Duch, David S.; Nichol, Charles A.; and Sigel, Carl W., 4,512,992, Cl. 514-258.000.
Signode Corporation: *See—*
Kobiella, Robert J., 4,512,844, Cl. 156-510.000.

Sigwardt, Peter L., to Getty Oil Company. Flow rate controller. 4,512,187, Cl. 73-198.000.
Simon, Donald R., to Prutec Limited. Thin-film, high pressure fuel cell. 4,513,066, Cl. 429-42.000.
Simon, John: *See*—
Sweatman, Ronald E.; Freeman, Earl R.; Gottschling, John; and Simon, John, 4,512,405, Cl. 166-278.000.
Simon, Ralph, to Chevron Research Company. Miscible displacement drive for enhanced oil recovery in low pressure reservoirs. 4,512,400, Cl. 166-245.000.
Simonet, Guy; and Hay, Leon, to L'Air Liquide, Societe Anonyme pour l'Etude l'Exploitation des Procedes Georges Claude. Adsorption processes. 4,512,778, Cl. 55-26.000.
Simpson, Howard D.: *See*—
Angmorter, Paul K.; Simpson, Howard D.; and Richardson, Ryden L., 4,513,097, Cl. 502-211.000.
Sinclair, Ronald R.: *See*—
Sebestyen, George; Sinclair, Ronald R.; Smith, John A.; Sands, Timothy B.; and Nussdorfer, Theodore J., 4,512,537, Cl. 244-3.210.
Singer Company, The: *See*—
Dicke, William C., 4,512,691, Cl. 408-201.000.
Galuschak, George; and Stomber, Richard J., 4,512,086, Cl. 33-324.000.
Houser, John, Jr.; and Laughon, Thomas C., 4,513,381, Cl. 364-475.000.
Laing, Gordon E.; Harbeck, Martin E.; Jones, John E.; Sumerau, William R.; and Glenn, William K., III, 4,512,057, Cl. 15-320.000.
Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,512,993, Cl. 514-275.000.
Singleton, Daniel A.: *See*—
Brunelle, Daniel J.; and Singleton, Daniel A., 4,513,141, Cl. 548-476.000.
Sinha, Bikash K.; and Gouilloud, Michel, to Schlumberger Technology Corporation. Surface acoustic wave sensors. 4,512,198, Cl. 73-703.000.
Siol, Werner: *See*—
Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, 4,513,118, Cl. 525-81.000.
SKF Kugellagerfabriken GmbH: *See*—
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, 4,512,670, Cl. 384-147.000.
Olschewski, Armin; Herrmann, Gerhard; Bauer, Bernhard; and Zirk, Elisabeth, 4,512,672, Cl. 384-477.000.
Skogward, Kenneth O. E., to Husqvarna Aktiebolag. Feeding mechanism in a sewing machine. 4,512,273, Cl. 112-315.000.
Skrobul, Anthony P.: *See*—
Schlicht, Raymond C.; and Skrobul, Anthony P., 4,512,903, Cl. 252-51.50A.
Skukowski, William T., to Tropicana Products, Inc. UPC Scannable marking composition and applications thereof. 4,513,027, Cl. 427-162.000.
Slade, Mark N.: *See*—
Abbott, James B.; Kohn, Ernest O.; Berry, Christopher; and Slade, Mark N., 4,512,172, Cl. 72-68.000.
Sledmere, Alan B., to Klinger AG. Magnetically operated liquid level indicator. 4,512,190, Cl. 73-319.000.
Smades, Jack E., to Sanders Associates, Inc. Precision wire grid glass digitizing tablets. 4,513,043, Cl. 428-113.000.
Small Precision Tools, Inc.: *See*—
Ellett, Kenneth W.; and Glutz, Peter, 4,513,190, Cl. 219-56.210.
Small, Vincent J., to Boeing Company, The. Digital conversion circuit and method for testing digital information transfer systems based on serial bit communication words. 4,513,419, Cl. 371-29.000.
Smith, Barry L.: *See*—
Schuller, James T.; Smith, Barry L.; and Griner, Paul K., 4,512,454, Cl. 194-1.00D.
Smith, David R., to Hesston Corporation. Flat fold implement frame. 4,512,416, Cl. 172-776.000.
Smith, Fred J., to Jayem Dialer Corp. Automatic calling systems for accessing communications networks. 4,513,175, Cl. 179-18.0BA.
Smith, Jack D.: *See*—
Foran, Charles D.; and Smith, Jack D., 4,512,694, Cl. 409-12.000.
Smith, John A.: *See*—
Sebestyen, George; Sinclair, Ronald R.; Smith, John A.; Sands, Timothy B.; and Nussdorfer, Theodore J., 4,512,537, Cl. 244-3.210.
Smith, Peter L.: *See*—
Gorman, Anthony G.; Smith, Peter L.; and Barrett, Paul Q., 4,513,413, Cl. 370-30.000.
Smith, Robert D., to Scandpower, Inc. Power performance monitoring system for nuclear reactor fuel core. 4,512,949, Cl. 376-247.000.
Smith, Russell G. Seal with preformed V-shaped packing rings and method. 4,512,586, Cl. 277-124.000.
Snamprogetti S.p.A.: *See*—
Fattore, Vittorio; Notari, Bruno; Paggini, Alberto; and Lagana , Vincenzo, 4,513,100, Cl. 502-303.000.
Gervasio, Vincenzo; and Dinelli, Dino, 4,513,206, Cl. 290-4.00C.
Sandrin, Romedio, 4,513,153, Cl. 568-697.000.
Snap-on Tools Corporation: *See*—
Barnhill, Martin L., III; and Pagac, William T., 4,512,220, Cl. 81-121.100.
Christophersen, Steven L., 4,512,222, Cl. 81-464.000.
Snyder, Warren E., to Dresser Industries, Inc. Method and apparatus for controlling air to gas ratio in gas engines. 4,512,304, Cl. 123-344.000.
Societe Anonyme dite: L'Oreal: *See*—
Maignan, Jean; and Shroot, Braham, 4,512,985, Cl. 514-301.000.
Societe Civile Bioprojet: *See*—
Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie, 4,513,009, Cl. 514-513.000.
Societe d'Etudes et de Constructions Electriques et Mecaniques Secem: *See*—
Hartmann, Michel, 4,512,738, Cl. 432-247.000.
Societe Nationale d'Etude de Constudies de Mateurs d'Aviation: *See*—
Mouton, Pierre C., 4,512,722, Cl. 417-63.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Devienne, Jules H. P., 4,512,538, Cl. 244-122.0AF.
Societe Pour L'Etude Et La Fabrication De Circuits Integres Speciaux - E.F.C.I.S.: *See*—
Sokoloff, Boris, 4,513,265, Cl. 333-214.000.
Soderberg, Jan: *See*—
Edgren, Anders; Soderberg, Jan; and Bergstrom, Bengt, 4,513,106, Cl. 521-58.000.
Sogabe, Toshio: *See*—
Nakagawa, Shinichi; Ihara, Kiyohiko; and Sogabe, Toshio, 4,513,129, Cl. 526-249.000.
Sokoloff, Boris, to Societe Pour L'Etude Et La Fabrication De Circuits Integres Speciaux - E.F.C.I.S. 3-Phase switched capacitor circuit having an inductive characteristic. 4,513,265, Cl. 333-214.000.
Soldavini, Teodoro. Grass cutting apparatus. 4,512,144, Cl. 56-202.000.
Solheim, Karsten. Set of golf clubs. 4,512,577, Cl. 273-77.00A.
Somers, Lowell. Benzoylecgonine or benzoylnorecgonine as active agents for the treatment of rheumatoid arthritis. 4,512,996, Cl. 514-304.000.
Somerville Belkin Industries Limited: *See*—
Zimmermann, John, 4,512,511, Cl. 229-15.000.
Sona-Tool Development Ltd.: *See*—
Kompanek, Harry W.; Ligman, James R.; and Plambeck, Eric D., 4,512,402, Cl. 166-249.000.
Sondermann, Thomas: *See*—
Dorr, Wolfgang; Gradel, Gerhard; Peehs, Martin; Schafer, Reinhard; and Sondermann, Thomas, 4,512,939, Cl. 264-0.500.
Sony Corporation: *See*—
Hirai, Jun; and Kaneko, Masayasu, 4,513,311, Cl. 358-40.000.
Otsuka, Toru, 4,513,334, Cl. 360-75.000.
Sopp, Samuel W.: *See*—
Howe, Michael W.; and Sopp, Samuel W., 4,512,823, Cl. 148-113.000.
Soule Fer et Froid S.A.: *See*—
Huon de Kermadec, Jean, 4,512,259, Cl. 104-208.000.
Souquet, Jean-Louis: *See*—
Carette, Brigitte; Kone, Ali; Souquet, Jean-Louis; Ribes, Michel; and Maurin, Maurice, 4,513,070, Cl. 429-193.000.
Southgate, John P.: *See*—
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,512,319, Cl. 123-492.000.
Spake, Ned B.: *See*—
Rodriguez, Larry A.; Padilla, Antonio A.; and Spake, Ned B., 4,512,387, Cl. 165-1.000.
Sparer, Randall V.; and Bhaskar, Ravi K., to Merck & Co., Inc. Variable permeability liquid crystalline membranes. 4,513,034, Cl. 428-1.000.
Sparta, Inc.: *See*—
Henshaw, Philip D., 4,513,441, Cl. 382-43.000.
Spater, Stuart S.: *See*—
Kolton, Chester; and Spater, Stuart S., 4,512,093, Cl. 40-20.00R.
Spear Harvesters: *See*—
Lund, William J., 4,512,145, Cl. 56-327.00A.
Spears, James R., to Beth Israel Hospital Association, The. Method of treatment of atherosclerosis and a balloon catheter for same. 4,512,762, Cl. 604-21.000.
Speca, Anthony N., to National Distillers and Chemical Corporation. Intermetallic compounds of polymeric transition metal oxide alkoxides and catalytic use thereof. 4,513,095, Cl. 502-111.000.
Specht, Theodore R.: *See*—
Novak, Paul G.; and Specht, Theodore R., 4,513,243, Cl. 323-361.000.
Spector, George: *See*—
Barfield, Michelle D.; and Spector, George, 4,513,035, Cl. 428-11.000.
Leininger, Glenn; and Spector, George, 4,512,091, Cl. 37-278.000.
Spectrospin AG: *See*—
Ernst, Richard R., 4,513,247, Cl. 324-309.000.
Speedy Automatic Chimney Sweep, Inc.: *See*—
Boehland, Burnell G.; and Coutts, Donald G., 4,512,055, Cl. 15-249.000.
Spencer, Billie M.: *See*—
Pike, Lawrence W.; Zscheile, John W., Jr.; and Spencer, Billie M., 4,513,285, Cl. 343-5.0PN.
Sperry Corporation: *See*—
Blakeslee, Edward A., 4,512,140, Cl. 56-11.600.
Clark, Thomas E.; and Burilla, Charles T., 4,513,025, Cl. 427-68.000.
Lefevre, Donald K.; Dennis, Patrick W.; and Seegmiller, Dennis F., 4,513,290, Cl. 343-745.000.
Musser, Glenn A.; Rayfield, James F.; and Pucher, Richard A., 4,512,139, Cl. 56-11.200.
Pike, Lawrence W.; Zscheile, John W., Jr.; and Spencer, Billie M., 4,513,285, Cl. 343-5.0PN.
Splinter, Bob C., to Peckson USA Corp. Inner and outer waste storage vaults with leak-testing accessibility. 4,513,205, Cl. 250-507.100.

SPOFA, spojene podniky pro zdravotnickou vyrobu: *See*—
Flegel, Martin; Pospisek, Jan; Picha, Josef; Pichova, Drahomira; Krojidlo, Milan; and Kolinsky, Jiri, 4,512,923, Cl. 260-112.5LH.
Wichterle, Otto, 4,512,461, Cl. 206-5.100.

Sponco Mfg., Inc.: *See*—
Howell, Donald J., 4,512,439, Cl. 182-66.000.

Spooner, Jerrold C., to General Electric Company. Method of tool recovery in threadcutting apparatus. 4,513,380, Cl. 364-474.000.

Sports Marketing, Inc.: *See*—
Vacanti, Eugene J., 4,512,037, Cl. 2-2.000.

Sprague Electric Company: *See*—
Coleman, James H., 4,513,350, Cl. 361-321.000.

Sprecher & Schuh AG: *See*—
Schaad, Walter; and Kull, Peter, 4,513,187, Cl. 200-144.0AP.

Sprecker, Mark A.: *See*—
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,512,918, Cl. 252-522.00R.

Sprehe, Josef: *See*—
Niemann, Hans-Joachim; and Sprehe, Josef, 4,512,957, Cl. 423-3.000.

Sprunt, Katherine: *See*—
Hodes, David S.; Leidy, Grace; Sprunt, Katherine; and Weldy, Piper, 4,513,083, Cl. 435-68.000.

SRI International: *See*—
Ng, Steven Y.; Penhale, Donald W.; and Heller, Jorge, 4,513,143, Cl. 549-335.000.

Sriram, Sambamurthy; Steinbruegge, Kenneth; and Supertzi, Emmanuel, to Westinghouse Electric Corp. Wire grid polarizer. 4,512,638, Cl. 350-372.000.

Staar, Marcel J., to Staar S. A. Helicoidal loading and unloading mechanism for disc player apparatus. 4,513,409, Cl. 369-77.100.

Staar S. A.: *See*—
Staar, Marcel J., 4,513,409, Cl. 369-77.100.

Staffin, Robert; Girrell, Carol A.; and Fronzoni, Mario A., to Procedyne Corp. Method for metal treatment using a fluidized bed. 4,512,821, Cl. 148-16.500.

Stafford, Irvin G.: *See*—
Seitz, Charles L.; Grunewald, Paul; Parker, Marshall M.; and Stafford, Irvin G., 4,513,278, Cl. 340-347.0DA.

Standard Microsystems Corporation: *See*—
Herman, Morton B., 4,513,174, Cl. 178-22.080.

Standard Oil Company: *See*—
Hazel, James A., 4,512,398, Cl. 166-70.000.

Standard Oil Company (Indiana): *See*—
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., 4,513,096, Cl. 502-185.000.

Stanley Electric Co., Ltd.: *See*—
Ikenoue, Tsuneo; Liu, Shin-yng; Arai, Naoki; and Umemoto, Shuichi, 4,513,360, Cl. 363-20.000.

Stargardter, Hans, to United Technologies Corporation. Tandem fan stage for gas turbine engines. 4,512,718, Cl. 416-231.00B.

Stark, Walter. Housing for cross flow heat exchanger. 4,512,397, Cl. 165-166.000.

State Industries, Inc.: *See*—
Collins, Denver G., 4,512,289, Cl. 122-380.000.

Stauffer Chemical Company: *See*—
Schillawski, Richard D., 4,513,152, Cl. 568-492.000.
Walker, Francis H., 4,512,796, Cl. 71-88.000.

Ste d'Application Platique Mecanique et Electronicque Plastimechanique S.A.: *See*—
Dronet, Jean-Marc; and Resseguier, Jacques, 4,512,734, Cl. 425-305.100.

Steam Systems and Services, Incorporated: *See*—
Schoonover, Kevin G., 4,512,520, Cl. 239-440.000.

Stein, Jeffrey A.: *See*—
Saravis, Lawrence M., deceased; Stein, Jeffrey A.; and Saravis, Darren S., 4,512,617, Cl. 308-6.00C.

Steinberg, Eckard, to Kraftwerk Union Aktiengesellschaft. Method for manufacturing a cladding tube of a zirconium alloy for nuclear reactor fuel of a nuclear reactor fuel assembly. 4,512,819, Cl. 148-11.50F.

Steinbruegge, Kenneth: *See*—
Sriram, Sambamurthy; Steinbruegge, Kenneth; and Supertzi, Emmanuel, 4,512,638, Cl. 350-372.000.

Steiner, Alois, to Maschinenfabrik Sulzer-Ruti AG. Lamellae comb for weaving apparatus, particularly for a weaving rotor in a multiple longitudinal traversing shed weaving loom, and method for manufacturing the same. 4,512,374, Cl. 139-191.000.

Stenvall, Carl-Johan, to NPI New Products Investment AB. Roller skate. 4,512,590, Cl. 280-11.230.

Stephens, Kenneth D., to Communications Design Group, Inc. Frequency selective antenna. 4,513,293, Cl. 343-840.000.

Stephens, Robert E.: *See*—
Schriber, Louis; Stephens, Robert E.; and Blaha, John F., 4,512,256, Cl. 101-248.000.

Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, 4,512,993, Cl. 514-275.000.

Sternad, Mikael: *See*—
Ling, Bernt; and Sternad, Mikael, 4,512,711, Cl. 414-786.000.

Sterner Lighting Systems, Incorporated: *See*—
Nielson, Wayne G., 4,513,359, Cl. 362-389.000.

Stevenson, Charles K., to Midland Gas Extractors, Inc. Gas extractor. 4,512,783, Cl. 55-160.000.

Stewart, Roger G.: *See*—
Ipri, Alfred C.; and Stewart, Roger G., 4,513,397, Cl. 365-185.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Puhringer, Franz, 4,512,223, Cl. 82-2.500.

Stiegler, Hartmut, to Buderus Aktiengesellschaft. Muffle oven for heating foodstuffs. 4,512,327, Cl. 126-21.00A.

Stiffey, Arthur V.: *See*—
Hannan, Patrick J.; Stiffey, Arthur V.; Jarvis, N. Lynn; and Wohltjen, Henry, 4,513,280, Cl. 340-632.000.

Stinson, Walter J.: *See*—
Jandrasi, Frank J.; Pampell, Davy G.; and Stinson, Walter J., 4,512,363, Cl. 137-375.000.

Stokes, Robert B.: *See*—
Yen, Kuo-Hsiung; Stokes, Robert B.; Lau, Kei-Fung; Kong, Alvin M.; and Kagiwada, Reynold S., 4,513,261, Cl. 333-194.000.

Stoll, Donald H.: *See*—
Woodward, Stewart A.; Hilty, Ronald L.; and Stoll, Donald H., 4,512,199, Cl. 73-725.000.

Stomber, Richard J.: *See*—
Galuschak, George; and Stomber, Richard J., 4,512,086, Cl. 33-324.000.

Stone, Orison W., to Pack Image, Inc. Apparatus for erecting a bottle carrier. 4,512,755, Cl. 493-92.000.

Stout, Thomas R., to Safety Cross Mirror Co., Inc. Mounting assembly for school bus mirror. 4,512,634, Cl. 350-632.000.

Strage, Jan W.: *See*—
Edlund, Olof A.; Enser, Mats A.; Strage, Jan W.; Thunberg, Svante B.; and Wallmark, Erik I., 4,513,393, Cl. 364-900.000.

Straubel, Max: *See*—
Hofer, Gerald; Straubel, Max; and Eheim, Franz, 4,512,308, Cl. 123-383.000.

Strauchler, Irving D.: *See*—
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,512,038, Cl. 3-1.900.

Stravitz, David M., to Lebo/Peerless Corp. Cassette storage device. 4,512,468, Cl. 206-387.000.

Streck, Roland: *See*—
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., 4,512,926, Cl. 260-398.000.

Striebel, Edmund E.; Matthews, John A.; Sepulveda, Domingo; and Pane, Francis C., Jr., to United Technologies Corporation. High blockage diffuser with means for minimizing wakes. 4,512,158, Cl. 60-740.000.

Striegel, William H.; and Schmitz, Willard H., to Kohler Co. Railing for spa or the like. 4,512,042, Cl. 4-496.000.

Strimling, Walter E. Pump adaptable for use as an artificial heart. 4,512,726, Cl. 417-412.000.

Stritzel, Gene A., to Gleason Works, The. Differential assembly having means for locking and positioning axle shafts therein. 4,512,211, Cl. 74-745.000.

Stroh, Alvin L., to McMillin Wire and Plating, Inc. Plastic bag rack for checkstand. 4,512,540, Cl. 248-95.000.

Struck, Bernd D.; Dias, Francisco J.; Luhleich, Hartmut; and Paffen nee Siebert, Ursula, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of producing an electrode usable as a flow-through anode. 4,512,858, Cl. 204-104.000.

Strutz, Winfried: *See*—
Marsoner, Hermann; Ritter, Christoph; Kleinhappl, Erich; and Strutz, Winfried, 4,512,953, Cl. 422-67.000.

Stump, Lee E., to Timesavers, Inc. Endless abrasive belts. 4,512,110, Cl. 51-141.000.

Suekane, Yasuhiro: *See*—
Noda, Ichiro; Suekane, Yasuhiro; and Nakao, Hisao, 4,512,889, Cl. 210-225.000.

Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, to Rohm GmbH. Emulsion polymers for modifying impact strength. 4,513,118, Cl. 525-81.000.

Suffi, Louis; Golden, James E.; and Jaycox, Donald F., to Northern Telecom Limited. Aerial cable terminal. 4,513,171, Cl. 174-41.000.

Sugerman, Gerald; and Monte, Salvatore J., to Kenrich Petrochemicals, Inc. Pyrophosphato titanate adducts. 4,512,928, Cl. 260-410.90R.

Sugiyama, Keiichi, to Yamaha Hatsudoki Kabushiki Kaisha. Intake control system for multi-valve type internal combustion engine. 4,512,311, Cl. 123-432.000.

Suica, David E.: *See*—
Hennekes, Daniel M.; Kolde, Richard A.; and Suica, David E., 4,512,709, Cl. 414-729.000.

Sumerau, William R.: *See*—
Laing, Gordon E.; Harbeck, Martin E.; Jones, John E.; Sumerau, William R.; and Glenn, William K., III, 4,512,057, Cl. 15-320.000.

Sumitomo Chemical Company, Limited: *See*—
Oi, Naobumi; and Kitahara, Hajimu, 4,512,898, Cl. 210-656.000.

Sumitomo Electric Industries, Ltd.: *See*—
Kita, Yasuo; Moriya, Michio; and Yoshida, Kenichi, 4,512,615, Cl. 303-97.000.
Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, 4,512,281, Cl. 118-627.000.

Sumitomo Metal Industries, Ltd.: *See*—
Hayashi, Chihiro; and Nakasuji, Kazuyuki, 4,512,177, Cl. 72-368.000.
Kaminaka, Motofumi; Takashima, Hiroyuki; and Kaburagi, Katsuhiko, 4,512,368, Cl. 137-561.00A.

Sumitomo Metal Mining Company Limited: *See*—
Miyazaki, Shu, 4,512,843, Cl. 156-644.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Oiwa, Isao, 4,512,664, Cl. 366-76.000.

Sumiya, Mitsuo: *See*—
Kamiya, Masashi; Ueda, Katsunobu; Sumiya, Mitsuo; and Tsukada, Tameyasu, 4,512,626, Cl. 350-6.800.

Sumner, Cyril R.: *See*—
Regalbuto, John A.; Patton, James B.; and Sumner, Cyril R., 4,512,418, Cl. 175-4.560.

Suncast Corporation: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,512,361, Cl. 137-355.270.

Sundstrand Corporation: *See*—
Hansen, Wayne W., 4,513,218, Cl. 310-270.000.
Williams, Keith R., 4,512,723, Cl. 417-222.000.

Sundstrand Data Control, Inc.: *See*—
Peters, Rex B., 4,512,192, Cl. 73-505.000.

Sunnen Products Company: *See*—
Vanderwal, Frank E., Jr.; and Davis, James K., 4,512,116, Cl. 51-347.000.

Sunwood Energy Products, Inc.: *See*—
Peachey, Kenneth G., 4,512,334, Cl. 126-430.000.

Superior Machinery Inc.: *See*—
Theien, Clarence M., 4,512,114, Cl. 51-288.000.

Supertzi, Emmanuel: *See*—
Sriram, Sambamurthy; Steinbruegge, Kenneth; and Supertzi, Emmanuel, 4,512,638, Cl. 350-372.000.

Surman, William K. Station locking rotary indexing table. 4,512,214, Cl. 74-820.000.

Suzaki, Masayuki; and Kanno, Tetuo, to Ricoh Co., Ltd. Printer cartridge and cartridge retaining means. 4,512,674, Cl. 400-208.000.

Suzuki, Fujio: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; and Tanaka, Koji, 4,513,327, Cl. 358-310.000.

Suzuki, Go; and Michishita, Kazuo, to NGK Insulators, Ltd. Ceramic body having a metallized layer. 4,513,062, Cl. 428-565.000.

Suzuki, Haruo: *See*—
Endoh, Kazunori; and Suzuki, Haruo, 4,512,237, Cl. 91-369.00A.

Suzuki, Isao: *See*—
Munekata, Kenichi; Doi, Yoshio; Suzuki, Isao; and Doi, Shigeru, 4,513,366, Cl. 364-167.000.

Suzuki, Junji: *See*—
Tanabe, Kenzo; and Suzuki, Junji, 4,513,209, Cl. 307-350.000.

Suzuki, Shigemi; and Mizukane, Masahiro, to Toto Ltd. Sliding guide. 4,512,616, Cl. 308-3.00R.

Suzuki, Shunsuke; Mori, Masanobu; and Miyata, Takeshi, to Nissan Motor Company, Limited. Die casting process and apparatus therefor. 4,512,383, Cl. 164-35.000.

Suzuki, Togi: *See*—
Kunugi, Katsuo; Suzuki, Togi; Konishi, Tadashi; and Ohwaki, Shinji, 4,513,114, Cl. 524-706.000.

Svay, Leng; Moriguchi, Haruhiko; and Inui, Toshiharu, to Fuji Xerox Co., Ltd. Heat-sensitive recording head. 4,513,296, Cl. 346-76.0PH.

Swagert, Dean R.: *See*—
Reslow, Leif F.; Nieman, Mark D.; and Swagert, Dean R., 4,512,254, Cl. 101-157.000.

Swanson, Carl A. Reversible drill and drive tool holder. 4,512,693, Cl. 408-239.00R.

Swearingen, Judson S. Process of purifying a recirculating working fluid. 4,512,851, Cl. 203-88.000.

Sweatman, Ronald E.; Freeman, Earl R.; Gottschling, John; and Simon, John, to Hughes Tool Company. Pneumatic transfer of solids into wells. 4,512,405, Cl. 166-278.000.

Sweet, Steven W. Heat circulating fireplace grate assembly for gas fired logs. 4,512,329, Cl. 126-121.000.

Swenson, Roy S.: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,512,849, Cl. 162-157.200.

Swiss Aluminium Ltd.: *See*—
Haller, Walter, 4,512,386, Cl. 164-467.000.

Sylvester, John D., to Amscomatic, Inc. Method of folding T-shirts and folded shirt arrangement resulting therefrom. 4,512,464, Cl. 206-292.000.

Syntex (U.S.A.), Inc.: *See*—
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,512,990, Cl. 514-225.000.

Szala, Lawrence E.: *See*—
Brun, Milivoj K.; Lee, Minyoung; and Szala, Lawrence E., 4,512,946, Cl. 264-332.000.

Szwarc, Raphael, to United States of America, Energy. Method of gas purification and system therefor. 4,512,960, Cl. 423-219.000.

T/B & H Home Video: *See*—
Coy, Don R., Jr.; and Giannis, Peter M., 4,512,534, Cl. 242-198.000.

Tabak, Samuel A., to Mobil Oil Corporation. Olefin oligomerization using extracted feed for production of heavy hydrocarbons. 4,513,156, Cl. 585-329.000.

Tadokoro, Masahiro: *See*—
Shigihara, Shigeyuki; and Tadokoro, Masahiro, 4,512,801, Cl. 75-58.000.

Tagaya, Nobuaki: *See*—
Sakurada, Satoshi; Hashimoto, Takao; Tagaya, Nobuaki; Maeshima, Tsugio; Ueda, Kayako; and Kokubo, Masahiro, 4,513,166, Cl. 585-832.000.

Taiho Kogyo Co., Ltd.: *See*—
Kaku, Yoshihiro; and Otsu, Keiichiro, 4,512,175, Cl. 72-360.000.

Takachiho Kogyo Yuugen Kaisha: *See*—
Shigemizu, Akihiko, 4,512,524, Cl. 241-101.700.

Takagi, Fusao: *See*—
Ohta, Hideo; Hakuzen, Tatuzo; Ito, Yasunori; and Takagi, Fusao, 4,512,829, Cl. 156-659.100.

Takagi, Mikio: *See*—
Miyamoto, Hidekazu; Shioya, Yoshimi; Maeda, Mamoru; and Takagi, Mikio, 4,513,026, Cl. 427-85.000.

Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; and Tanaka, Koji, to Victor Company of Japan, Ltd. Digital signal recording system and reproducing apparatus. 4,513,327, Cl. 358-310.000.

Takahashi, Susumu, to Niigata Engineering Co., Ltd. Emergency disconnector for fluid loading and unloading lines. 4,512,369, Cl. 137-614.040.

Takano, Teruhisa: *See*—
Ueda, Shigeki; and Takano, Teruhisa, 4,513,189, Cl. 219-10.55B.

Takasago USA, Inc.: *See*—
Harden, Theodore A., 4,512,933, Cl. 261-30.000.

Takashima, Hiroyuki: *See*—
Kaminaka, Motofumi; Takashima, Hiroyuki; and Kaburagi, Katsuhiko, 4,512,368, Cl. 137-561.00A.

Takashima, Seiichi: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; and Tanaka, Koji, 4,513,327, Cl. 358-310.000.

Takayama, Yukio; Noguchi, Akio; and Matsushita, Takao, to Kanzaki Paper Manufacturing Company Limited. Heat-sensitive recording material. 4,513,301, Cl. 346-200.000.

Takeda Chemical Industries, Ltd.: *See*—
Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, 4,512,975, Cl. 424-121.000.
Matsuura, Kazumi; and Wada, Takeo, 4,512,962, Cl. 423-331.000.

Takeda, Hiroaki: *See*—
Ishida, Masato; and Takeda, Hiroaki, 4,512,655, Cl. 355-55.000.

Takeda, Masami: *See*—
Mizui, Kinya; Takeda, Masami; and Iwata, Tadao, 4,513,130, Cl. 526-283.000.

Takeda Riken Co., Ltd.: *See*—
Kurihara, Takenori; Tojo, Shigeki; and Hirakoso, Yohei, 4,513,256, Cl. 331-4.000.

Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device and process for producing the same. 4,513,304, Cl. 357-23.600.

Takemoto, Issei: *See*—
Shoji, Fusaji; Takemoto, Issei; Kataoka, Fumio; Yokono, Hitoshi; and Isogai, Tokio, 4,513,132, Cl. 528-21.000.

Takemura, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid-state color television camera. 4,513,312, Cl. 358-44.000.

Takeno, Hidekazu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.

Takeshima, Hideo: *See*—
Umezawa, Iwao; Komiyama, Kanki; and Takeshima, Hideo, 4,512,976, Cl. 424-122.000.

Takeuchi, Hiroshi; and Maruno, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Diaphragm for loudspeakers. 4,512,435, Cl. 181-170.000.

Takimoto, Masatami: *See*—
Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Takimoto, Masatami; and Teramura, Mitsuyoshi, 4,512,312, Cl. 123-439.000.

Takumi, Shigeji: *See*—
Watanabe, Toshimitu; Sakai, Masayuki; Minami, Kazutoshi; and Takumi, Shigeji, 4,512,239, Cl. 98-2.030.

Talke, Frank E.: *See*—
Lee, Francis C.; Mills, Ross N.; Payne, Robert N.; and Talke, Frank E., 4,513,299, Cl. 346-140.00R.

Tamukai, Tadao: *See*—
Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, 4,512,675, Cl. 400-328.000.

Tamura, Kunimitsu; and Hosonuma, Kunihiko, to Nippon Mining Co., Ltd.; and Mitsui Engineering & Shipbuilding Co., Ltd. Lubricating oil for diesel engines. 4,513,155, Cl. 585-13.000.

Tanabe, Kenzo; and Suzuki, Junji, to Matsushita Electric Industrial Co., Ltd. Level detector. 4,513,209, Cl. 307-350.000.

Tanabe, Osami: *See*—
Okazaki, Masaki; Tanabe, Osami; Nagaoka, Satoshi; Mihara, Yuji; Kimura, Keizo; and Umemoto, Makoto, 4,513,081, Cl. 430-550.000.

Tanabe, Toshio; and Kita, Masakazu, to Matsushita Electric Works, Ltd. Electric shaver having improved shaving characteristics. 4,512,077, Cl. 30-43.000.

Tanaka, Hirokazu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,512,980, Cl. 514-18.000.

Tanaka, Koji: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; and Tanaka, Koji, 4,513,327, Cl. 358-310.000.

Tanaka, Takeshi: *See*—
Igashira, Toshihiko; Kawai, Hisasi; Tanaka, Takeshi; Iwamoto, Kenzi; Abe, Seiko; and Hashimoto, Eiji, 4,512,307, Cl. 123-383.000.

Tanaka, Yoshikazu; Yamamuro, Sigeaki; Hirano, Hiroyuki; and Morimoto, Yoshiro, to Nissan Motor Company, Limited. Method and system for controlling continuously variable v-belt transmission. 4,512,751, Cl. 474-28.000.

Tanaka, Yuzuru: *See*—
Tsuchida, Tsuyoshi; Kido, Yoshinobu; Kakumoto, Hideki; and Tanaka, Yuzuru, 4,512,313, Cl. 123-440.000.

Tang, Wai-Cheung: *See—*
Dorey, James B.; and Tang, Wai-Cheung, 4,513,264, Cl. 333-212.000.
Tanica Electric Co., Ltd.: *See—*
Yamauchi, Masakatu, 4,512,865, Cl. 204-271.000.
Tanida, Seiichi: *See—*
Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, 4,512,975, Cl. 424-121.000.
Tansuwan, Chusak, to ACF Industries, Inc. Spark control apparatus. 4,512,309, Cl. 123-425.000.
Tapco Products Company, Inc.: *See—*
Rhoades, James J., 4,512,174, Cl. 72-319.000.
Tarcisio, Re, to Victor Slicing Systems S.r.l. Automatic sausage slicing machine for salami and like products. 4,512,228, Cl. 83-355.000.
Tardivel, Georges M., to Tardivel, Monique M. Rope climbing exercise apparatus. 4,512,570, Cl. 272-112.000.
Tardivel, Monique M.: *See—*
Tardivel, Georges M., 4,512,570, Cl. 272-112.000.
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Apparatus for driving a semiconductor laser for use in a laser-beam printer. 4,513,300, Cl. 346-160.000.
Taub, Alan I., to General Electric Company. Dynamic annealing method for optimizing the magnetic properties of amorphous metals. 4,512,824, Cl. 148-121.000.
Taura, Mitsuharu: *See—*
Abe, Shinichi; Taura, Mitsuharu; Amano, Hidetoshi; and Mizuno, Toshiaki, 4,512,320, Cl. 123-492.000.
Taureg, Herbert: *See—*
Petrzelka, Miloslav; and Taureg, Herbert, 4,512,679, Cl. 403-57.000.
Taylor, Allan H.: *See—*
Jackson, L. Robert; Davis, Randall C.; and Taylor, Allan H., 4,512,699, Cl. 411-368.000.
Teague, Catherine E.: *See—*
Vayenas, Costas G.; and Teague, Catherine E., 4,512,964, Cl. 423-403.000.
Teche, Andre : *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,513,139, Cl. 546-196.000.
Technical Support Services, Inc.: *See—*
McLaughlin, Thomas F.; and Diaz, Gerard J., 4,512,092, Cl. 40-2.00R.
Tecnoma: *See—*
Ballu, Patrick J., 4,512,516, Cl. 239-168.000.
Teijin Limited: *See—*
Kunugi, Katsuo; Suzuki, Togi; Konishi, Tadashi; and Ohwaki, Shinji, 4,513,114, Cl. 524-706.000.
Tektronix, Inc.: *See—*
Lamb, James S.; and Wimmer, Warren K., 4,513,417, Cl. 371-12.000.
Tencor Instruments: *See—*
Galbraith, Lee K.; and Pecen, Jiri, 4,512,659, Cl. 356-243.000.
Tennant, William A.: *See—*
Kudert, Frederick G.; Tennant, William A.; and Tung, Thomas T., 4,512,730, Cl. 425-130.000.
Tennessee Valley Authority: *See—*
Harrison, Cecil P., 4,512,793, Cl. 71-29.000.
Tenney, William L., to London Fog, Inc. Thermal fog generator. 4,512,515, Cl. 239-129.000.
Teramura, Mitsuyoshi: *See—*
Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Takimoto, Masatami; and Teramura, Mitsuyoshi, 4,512,312, Cl. 123-439.000.
Terashima, Isamu: *See—*
Tatsuno, Kimio; Saito, Susumu; Ito, Shoichi; Terashima, Isamu; Homma, Yoshifumi; Asano, Mitsugu; and Ono, Yoshifumi, 4,513,300, Cl. 346-160.000.
Terauchi, Isamu, to Kabushiki Kaisha Kindai. Slitter device. 4,512,224, Cl. 82-48.000.
Terauchi, Kiyoshi: *See—*
Sakamoto, Seiichi; and Terauchi, Kiyoshi, 4,512,729, Cl. 418-55.000.
Terbrack, William H., to Hughes Aircraft Company. Phase locked crystal oscillator implemented with digital logic elements. 4,513,255, Cl. 331-1.00A.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,513,139, Cl. 546-196.000.
Martel, Jacques; Tessier, Jean; Demoute, Jean-Pierre; and Jolly, Jean, 4,513,147, Cl. 562-506.000.
Tetra Pak Developpement SA: *See—*
Rausing, Anders R., 4,512,838, Cl. 156-203.000.
Rausing, Hans, 4,512,832, Cl. 156-86.000.
Tetra Pak International AB: *See—*
Hilmersson, Anders; Lagerstedt, Jan; and Andersson, Helge, 4,512,935, Cl. 261-79.00A.
Jarund, Erik, 4,512,472, Cl. 206-443.000.
Tetsuishi, Yoshinori: *See—*
Matsuda, Naotoshi; Tetsuishi, Yoshinori; and Higuchi, Kazuaki, 4,512,912, Cl. 252-301.60S.
Teuling, Dirk J. A., to U.S. Philips Corporation. Circuit for generating a sawtooth-shaped current. 4,513,228, Cl. 315-408.000.
Tewksbury, Ted L.: *See—*
Attia, Yosry A.; and Tewksbury, Ted L., 4,512,879, Cl. 209-3.000.
Texaco Inc.: *See—*
Dominguez, Richard J. G., 4,513,133, Cl. 528-49.000.
Schlicht, Raymond C.; and Skrobul, Anthony P., 4,512,903, Cl. 252-51.50A.
Texas A&M University System, The: *See—*
Clearfield, Abraham; and Jerus, Paul, 4,512,905, Cl. 252-62.200.
Texas Instruments Incorporated: *See—*
Bonifield, Thomas D.; and Purdes, Andrew J., 4,512,283, Cl. 118-723.000.
Purdes, Andrew J.; and Bonifield, Thomas D., 4,513,021, Cl. 427-38.000.
Ragan, Lawrence H., 4,513,260, Cl. 333-165.000.
Textron Inc.: *See—*
Flatau, Carl R., 4,512,710, Cl. 414-735.000.
Thalenfeld, David R., to Trion Industries, Inc. Merchandise display hook. 4,512,481, Cl. 211-57.100.
Theien, Clarence M., to Superior Machinery Inc. Method for high tooth equalization of cutters. 4,512,114, Cl. 51-288.000.
Therma-Wave, Inc.: *See—*
Rosencwaig, Allan, 4,513,384, Cl. 364-563.000.
Thermo King Corporation: *See—*
Hanson, Jay L., 4,512,295, Cl. 123-145.00A.
Thevis, Paul; and Danner, Helmut, to Heckler & Koch GmbH. Sound dampened automatic hand firearm. 4,512,236, Cl. 89-128.000.
Thieken, Michael L.: *See—*
Archer, Wendel E.; Luther, James M.; and Thieken, Michael L., 4,512,627, Cl. 350-96.200.
Thielemans, Kristiaan: *See—*
Levy, Ronald; Maloney, David G.; and Thielemans, Kristiaan, 4,513,088, Cl. 436-518.000.
Thieme, Thomas R.: *See—*
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,512,990, Cl. 514-225.000.
Thomas & Betts Corporation: *See—*
Apodaca, Jeffrey S., 4,513,170, Cl. 174-36.000.
Bethurum, Gary C., 4,512,621, Cl. 339-99.00R.
Thomas, Graham Edward: *See—*
Green, Kenneth, 4,512,251, Cl. 99-472.000.
Thomas, Ralph H., Sr.: *See—*
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,512,485, Cl. 215-225.000.
Thomas, Robert L., to Westinghouse Electric Corp. Vacuum interrupter contact structure and method of fabrication. 4,513,186, Cl. 200-144.00B.
Thomas, Stanley N., to Pacific Power Control, Inc. Fluorescent-lighting-system voltage controller. 4,513,224, Cl. 315-141.000.
Thomassen International B.V.: *See—*
Alink, Aloysius J. W. O.; and van Marle, Berend P., 4,512,759, Cl. 494-14.000.
Thomaswick, Ronald J.; and Rowley, James R., to PPG Industries, Inc. Adjustable shipping container for frangible sheet-like units. 4,512,473, Cl. 206-454.000.
Thompson, John P., to Phillips Mine & Mill, Inc. Shear dolly for long wall mining. 4,512,706, Cl. 414-373.000.
Thompson, John R.: *See—*
Ng, Yee S.; Jarvis, James G.; and Thompson, John R., 4,512,653, Cl. 355-16.000.
Thompson, Kenneth P.; and Ihde, Richard C., to Champion International Corporation. Barrier laminates for containment of essential oils and flavors and cartons made therefrom. 4,513,036, Cl. 428-35.000.
Thompson, Ralph B., to PPG Industries, Inc. Method for producing esters from highly hindered carboxylic acids or their salts, and carbonates. 4,513,146, Cl. 560-231.000.
Thompson, Timothy J., to Marathon Oil Company. Skimmer for floating roof tanks. 4,512,883, Cl. 210-123.000.
Thompson, William L.: *See—*
Ghering, Walter L.; and Thompson, William L., 4,512,200, Cl. 73-861.040.
Thomson-CSF: *See—*
Bricot, Claude, 4,513,407, Cl. 369-44.000.
Coutures, Jean L., 4,513,211, Cl. 307-530.000.
Drabowitch, Serge, 4,513,291, Cl. 343-771.000.
Estang, Bernard, 4,512,448, Cl. 188-378.000.
Penhard, Serge J., 4,513,287, Cl. 343-5.0CF.
Pham Ngu, Tung, 4,513,398, Cl. 365-189.000.
Thorn, Joseph H.; and Prusak, John J., to RCA Corporation. Disc turnover device. 4,512,455, Cl. 198-404.000.
Thunberg, Svante B.: *See—*
Edlund, Olof A.; Enser, Mats A.; Strage, Jan W.; Thunberg, Svante B.; and Wallmark, Erik I., 4,513,393, Cl. 364-900.000.
Tichy, Heinz: *See—*
Waniek, Kurt; and Tichy, Heinz, 4,513,046, Cl. 428-156.000.
Tielens, Arthur J.: *See—*
Pohland, Horst; and Tielens, Arthur J., 4,512,959, Cl. 423-121.000.
Tiemens, Ulf: *See—*
Weiss, Hermann; Linde, Rolf; Tiemens, Ulf; and Klotz, Erhard, 4,513,433, Cl. 378-2.000.
Tienkamp, Engbert: *See—*
Breimer, Hendrik; Van Roessel, Frederik J.; and Tienkamp, Engbert, 4,513,319, Cl. 358-163.000.
Tilch, Willi: *See—*
Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, 4,513,118, Cl. 525-81.000.
Tillotson, John D., to Elco Corporation. Mass termination electrical connector. 4,512,620, Cl. 339-97.00P.
Tillotson, John G. Method for forming a layer of blown cellular urethane on a carpet backing. 4,512,831, Cl. 156-78.000.

Timesavers, Inc.: *See*—
Stump, Lee E., 4,512,110, Cl. 51-141.000.
Timken Company, The: *See*—
Cameron, Robert W., 4,512,525, Cl. 241-207.000.
Tingey, Albert R.: *See*—
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,512,319, Cl. 123-492.000.
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, to Suncast Corporation. Hose storage apparatus. 4,512,361, Cl. 137-355.270.
Tisbo, Thomas A.: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,512,361, Cl. 137-355.270.
TMC Corporation: *See*—
Muad, Al-Madhi, 4,512,698, Cl. 411-337.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Sakurada, Satoshi; Hashimoto, Takao; Tagaya, Nobuaki; Maeshima, Tsugio; Ueda, Kayako; and Kokubo, Masahiro, 4,513,166, Cl. 585-832.000.
Tober, Edward: *See*—
Moore, William H.; Mandel, Alan F.; Trosky, William J.; Eichler, Kenneth M.; Tomas, Stephen P.; Tober, Edward; and Vasold, Thomas A., 4,512,442, Cl. 187-29.00R.
Tobias, Philip E. Plate scanner for printing plates. 4,512,662, Cl. 356-380.000.
Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory. 4,513,399, Cl. 365-189.000.
Toda, Kenji: *See*—
Drzewiecki, Tadeusz M.; Toda, Kenji; and Gurney, John, 4,512,371, Cl. 137-828.000.
Todd, Alec: *See*—
Baker, Stephen R.; Jamieson, William B.; Ross, William J.; and Todd, Alec, 4,513,005, Cl. 514-451.000.
Togashi, Mokichi. Ignition plug with air passage and double check valve. 4,513,220, Cl. 313-120.000.
Tohge, Takeya, to Nippon Yakin Kogyo Kabushiki Kaisha. Process for the decarburization of molten metal. 4,512,802, Cl. 75-60.000.
Tohoku Ricoh Co., Ltd.: *See*—
Ikenoue, Tsuneo; Liu, Shin-yng; Arai, Naoki; and Umemoto, Shuichi, 4,513,360, Cl. 363-20.000.
Tojo, Shigeki: *See*—
Kurihara, Takenori; Tojo, Shigeki; and Hirakoso, Yohei, 4,513,256, Cl. 331-4.000.
Tokai TRW & Co. Ltd.: *See*—
Abe, Michio; Maeda, Naoyuki; and Lynas, Robert M., 4,512,367, Cl. 137-554.000.
Tokico Ltd.: *See*—
Miura, Ieaki, 4,512,447, Cl. 188-322.150.
Tokuda, Ryuji, to Canon Kabushiki Kaisha. Exposure control device for camera. 4,512,643, Cl. 354-21.000.
Tokumitsu, Jun; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Original reading apparatus. 4,512,632, Cl. 350-167.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aizawa, Yukio, 4,513,362, Cl. 363-41.000.
Etou, Kazumi; and Komoto, Tetsuo, 4,512,162, Cl. 62-298.000.
Ishihara, Atsushi, 4,513,406, Cl. 369-32.000.
Kamata, Isao, 4,513,208, Cl. 307-139.000.
Kamiya, Masashi; Ueda, Katsunobu; Sumiya, Mitsuo; and Tsukada, Tameyasu, 4,512,626, Cl. 350-6.800.
Matsui, Toshiro, 4,512,954, Cl. 422-106.000.
Matsumoto, Hiroshi; and Nawata, Yoshiaki, 4,512,565, Cl. 271-294.000.
Nieda, Yasuhiro; and Honda, Kiyokazu, 4,513,357, Cl. 362-228.000.
Ohno, Junichi; and Konishi, Satoshi, 4,513,310, Cl. 357-68.000.
Sasaki, Gen, 4,512,074, Cl. 29-576.00W.
Sato, Fumitaka, 4,513,369, Cl. 364-200.000.
Takemura, Yasuo, 4,513,312, Cl. 358-44.000.
Tomas, Stephen P.: *See*—
Moore, William H.; Mandel, Alan F.; Trosky, William J.; Eichler, Kenneth M.; Tomas, Stephen P.; Tober, Edward; and Vasold, Thomas A., 4,512,442, Cl. 187-29.00R.
Tomaszewski, Walter, to Firestone Tire & Rubber Company, The. Channel connector. 4,512,680, Cl. 403-313.000.
Tomei Sangyo Kabushiki Kaisha: *See*—
Yamauchi, Masakatu, 4,512,865, Cl. 204-271.000.
Tomisawa, Naoki, to Japan Electronic Control Systems Company, Limited. Electronically controlled fuel injection system for internal combustion engine. 4,512,315, Cl. 123-478.000.
Tomiyama, Tadao, to Mitsubishi Denki Kabushiki Kaisha. Pressure density equalizing apparatus for two vessels. 4,513,213, Cl. 310-156.000.
Tomsa, Vladimir, to Allied Corporation. Electrical connector assembly having means for shielding electromagnetic interference. 4,512,623, Cl. 339-143.00R.
Tone, Syoiti; and Kubota, Norio, to Murata Kikai Kabushiki Kaisa. Doffing control system in automatic winder. 4,512,526, Cl. 242-36.000.
Topic, Nicola: *See*—
Molzer, Peter; Pollner, Jurgen; Topic, Nicola; Trummer, Gregor; and Zurek, Rudolf, 4,512,560, Cl. 269-20.000.
Torrington Company, The: *See*—
Condon, Charles E., Jr.; and Malik, J. Peter, 4,512,673, Cl. 384-569.000.
Linnemeier, Elmer H., 4,512,209, Cl. 74-492.000.
Torterotot, Roland, to Pak Pro International, N.V. Device for sterilizing a thermoplastic strip used for the hot-forming of sterile containers and sterile packaging installation using the device. 4,512,133, Cl. 53-167.000.
Toto Ltd.: *See*—
Suzuki, Shigemi; and Mizukane, Masahiro, 4,512,616, Cl. 308-3.00R.
Townsley, Phillip M.: *See*—
Coulthard, T. Lionel; Townsley, Phillip M.; and Saben, Hugh S., 4,512,103, Cl. 47-1.100.
Toybox Corporation: *See*—
Matsumoto, Hajime; and Abe, Yoichi, 4,512,748, Cl. 446-354.000.
Toyo Seikan Kaisha Limited: *See*—
Kobayashi, Hiroshi; and Kousaka, Michio, 4,512,486, Cl. 215-249.000.
Toyoda Gosei Co., Ltd.: *See*—
Shigeki, Kiyoshi; and Maeno, Kunio, 4,513,044, Cl. 428-122.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Munekata, Kenichi; Doi, Yoshio; Suzuki, Isao; and Doi, Shigeru, 4,513,366, Cl. 364-167.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Abe, Shinichi; Taura, Mitsuharu; Amano, Hidetoshi; and Mizuno, Toshiaki, 4,512,320, Cl. 123-492.000.
Chuwman, Tsutomu; Hagino, Tetsu; and Tsuchida, Shozaburo, 4,512,446, Cl. 188-73.380.
Igashira, Toshihiko; Kawai, Hisasi; Tanaka, Takeshi; Iwamoto, Kenzi; Abe, Seiko; and Hashimoto, Eiji, 4,512,307, Cl. 123-383.000.
Ito, Toshimitsu; and Isobe, Toshiaki, 4,512,318, Cl. 123-492.000.
Nakamura, Norihiko; Itou, Takaaki; Katou, Takashi; Takimoto, Masatami; and Teramura, Mitsuyoshi, 4,512,312, Cl. 123-439.000.
Nakano, Hiromichi; Sasaya, Hideaki; Inagaki, Mitsuo; Matsui, Kazuma; and Yoshimura, Kunimasa, 4,512,728, Cl. 418-3.000.
Watanabe, Toshimitu; Sakai, Masayuki; Minami, Kazutoshi; and Takumi, Shigeji, 4,512,239, Cl. 98-2.03u.
Travers, Mark D.: *See*—
Karagoz, Berch Y.; Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,513,425, Cl. 373-88.000.
Trindl, Mary F., executrix: *See*—
Vilchek, Andrew, deceased; and Trindl, Mary F., executrix, 4,512,438, Cl. 182-43.000.
Trinh, Toan, to Procter & Gamble Company, The. No rinse liquid car cleaner kit with liquid cleaner and bristle pad. 4,512,677, Cl. 401-27.000.
Trinity Associates, a Partnership of the State of Pennsylvania: *See*—
Christine, William C., 4,512,136, Cl. 53-410.000.
Trion Industries, Inc.: *See*—
Thalenfeld, David R., 4,512,481, Cl. 211-57.100.
Trippel, Gerhard: *See*—
Brunsch, Arwed; Ruh, Wolf-Dieter; and Trippel, Gerhard, 4,512,847, Cl. 156-626.000.
Tropicana Products, Inc.: *See*—
Skukowski, William T., 4,513,027, Cl. 427-162.000.
Troponwerke GmbH & Co. KG: *See*—
Boltze, Karl-Heinz; and Horstn.ann, Harald, 4,513,004, Cl. 514-414.000.
Trosky, William J.: *See*—
Moore, William H.; Mandel, Alan F.; Trosky, William J.; Eichler, Kenneth M.; Tomas, Stephen P.; Tober, Edward; and Vasold, Thomas A., 4,512,442, Cl. 187-29.00R.
Trost, Wayne C., to Barber-Colman Company. Feeding and guiding means for triaxial fabric forming machine. 4,512,373, Cl. 139-11.000.
Trostle, D. Mark; Kaltz, Milton C.; Moler, Ronald; and Cowsert, Lendell E., to ASC Incorporated. Convertible top boot cover. 4,512,606, Cl. 296-130.000.
Troy, George W., to Exploration Logging, Inc. Data encoding and synchronization for pulse telemetry. 4,513,403, Cl. 367-83.000.
Trummer, Gregor: *See*—
Molzer, Peter; Pollner, Jurgen; Topic, Nicola; Trummer, Gregor; and Zurek, Rudolf, 4,512,560, Cl. 269-20.000.
Trumpp, Hans J.: *See*—
Bohlen, Harald; Engelke, Helmut; Greschner, Johann; Muhl, Reinhold; Nehmiz, Peter; and Trumpp, Hans J., 4,513,203, Cl. 250-491.100.
TRW Inc.: *See*—
Leibowitz, Joseph D., 4,513,055, Cl. 428-245.000.
Yen, Kuo-Hsiung; Stokes, Robert B.; Lau, Kei-Fung; Kong, Alvin M.; and Kagiwada, Reynold S., 4,513,261, Cl. 333-194.000.
Tsai, Tseng B. Dispensing device. 4,512,041, Cl. 4-227.000.
Tsao, Ying-Yen P., to Mobil Oil Corporation. Multimetallic catalysts and their method of preparation from organometallic precursors. 4,513,098, Cl. 502-216.000.
Tsou, John L., to McQuay, Inc. High pressure feedwater heater closure assembly. 4,512,496, Cl. 220-319.000.
Tsuboshima, Kosaku; and Yoshinari, Shigeru, to Olympus Optical Co., Ltd. Ionic concentration measuring apparatus and method. 4,512,852, Cl. 204-1.00T.
Tsuchida, Shozaburo: *See*—
Chuwman, Tsutomu; Hagino, Tetsu; and Tsuchida, Shozaburo, 4,512,446, Cl. 188-73.380.
Tsuchida, Tsuyoshi; Kido, Yoshinobu; Kakumoto, Hideki; and Tanaka, Yuzuru, to Mazda Motor Corporation. Engine control system having exhaust gas sensor. 4,512,313, Cl. 123-440.000.
Tsuji, Shisaku: *See*—
Kubota, Shikibu; and Tsuji, Shisaku, 4,513,276, Cl. 340-52.00R.
Tsujimura, Harutoshi: *See*—
Maeda, Kouzo; and Tsujimura, Harutoshi, 4,512,604, Cl. 296-65.00A.

Tsukada, Tameyasu: *See—*
Kamiya, Masashi; Ueda, Katsunobu; Sumiya, Mitsuo; and Tsukada, Tameyasu, 4,512,626, Cl. 350-6.800.
Tsuneishi, Katsuyuki: *See—*
Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, 4,512,281, Cl. 118-627.000.
Tucci, Allan T., to McDonnell Douglas Corporation. Method of producing composite structural members. 4,512,836, Cl. 156-174.000.
Tung, Thomas T.: *See—*
Kudert, Frederick G.; Tennant, William A.; and Tung, Thomas T., 4,512,730, Cl. 425-130.000.
Tunoda, Kikuo, to Ryobi Limited. Fishing reel with traverse-cam member rotatably mounted on anti-reverse shaft. 4,512,531, Cl. 242-84.21R.
Turban, Martin M.: *See—*
Karagoz, Berch Y.; Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,513,425, Cl. 373-88.000.
Turner, Donald. Mathematical teaching cards. 4,512,746, Cl. 434-209.000.
Turner, Tyson M.: *See—*
Claus, Richard O.; and Turner, Tyson M., 4,512,661, Cl. 356-351.000.
Tweed, William J.: *See—*
Chappell, William A.; Tweed, William J.; and Higgins, David T., 4,512,246, Cl. 99-312.000.
Tzakis, George J.: *See—*
Reneau, Daniel L.; Tzakis, George J.; and Engel, Christopher M., 4,513,320, Cl. 358-166.000.
Tzeng, Kuo-Nan. Racquet having strings of equal length. 4,512,575, Cl. 273-73.00D.
UBE Industries, Ltd.: *See—*
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,512,893, Cl. 210-500.200.
Uchigaki, Takatoshi; Saito, Akio; and Yamada, Naoki, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Device for automatically and continuously measuring the constituent parts of blood. 4,512,348, Cl. 128-632.000.
Uchiyama, Naoki: *See—*
Hosoda, Naoyuki; Uchiyama, Naoki; and Kawanaka, Ryusuke, 4,512,950, Cl. 420-563.000.
Uddenberg, Goran O., to AB Vacuum-Extractor. Obstetric suction device. 4,512,347, Cl. 128-352.000.
Ueda, Katsunobu: *See—*
Kamiya, Masashi; Ueda, Katsunobu; Sumiya, Mitsuo; and Tsukada, Tameyasu, 4,512,626, Cl. 350-6.800.
Ueda, Kayako: *See—*
Sakurada, Satoshi; Hashimoto, Takao; Tagaya, Nobuaki; Maeshima, Tsugio; Ueda, Kayako; and Kokubo, Masahiro, 4,513,166, Cl. 585-832.000.
Ueda, Kenji: *See—*
Miyamoto, Kiyoshi; and Ueda, Kenji, 4,513,257, Cl. 331-65.000.
Ueda, Mitsuhiro: *See—*
Miwa, Hirohide; and Ueda, Mitsuhiro, 4,512,195, Cl. 73-602.000.
Ueda, Shigeki; and Takano, Teruhisa, to Matsushita Electric Industrial Co., Ltd. Heating apparatus having voice command control operative in a conversational processing manner. 4,513,189, Cl. 219-10.55B.
Ueno, Takahiro. Method for driving a vehicle driven by an internal combustion engine. 4,512,154, Cl. 60-626.000.
Ukigai, Toshiyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,512,404, Cl. 166-274.000.
Ultra Mileager Company, Inc.: *See—*
Ruth, John V.; and Potts, Garfield C., 4,512,323, Cl. 123-557.000.
Ultra-Temp Corporation: *See—*
Lueth, Roy C., 4,512,558, Cl. 266-249.000.
Ulveling, Leon: *See—*
Mailliet, Pierre; and Ulveling, Leon, 4,512,702, Cl. 414-202.000.
Umble, Don G.; Choong, Tsi-Pin; Izzo, Kenneth R.; Burdg, Charles E.; Hankin, Gary H.; and Dalke, Charles A., to General Electric Company. Instrument for calibrating pressure gauges. 4,512,179, Cl. 73-4.00R.
UMC Industries, Inc.: *See—*
Schuller, James T.; Griner, Paul K.; and Mak, Nai H., 4,512,453, Cl. 194-1.00N.
Schuller, James T.; Smith, Barry L.; and Griner, Paul K., 4,512,454, Cl. 194-1.00D.
Umehara, Akihiko: *See—*
Nose, Isamu; and Umehara, Akihiko, 4,513,436, Cl. 381-43.000.
Umemoto, Makoto: *See—*
Okazaki, Masaki; Tanabe, Osami; Nagaoka, Satoshi; Mihara, Yuji; Kimura, Keizo; and Umemoto, Makoto, 4,513,081, Cl. 430-550.000.
Umemoto, Shuichi: *See—*
Ikenoue, Tsuneo; Liu, Shin-yng; Arai, Naoki; and Umemoto, Shuichi, 4,513,360, Cl. 363-20.000.
Umezawa, Iwao; Komiyama, Kanki; and Takeshima, Hideo, to Kitasato Institute, The. Antibiotic stubomycin and process for the production thereof. 4,512,976, Cl. 424-122.000.
Unger, Stefan H.: *See—*
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,512,990, Cl. 514-225.000.
Uni-Cardan Aktiengesellschaft: *See—*
Petrzelka, Miloslav; and Taureg, Herbert, 4,512,679, Cl. 403-57.000.
Union Carbide Corporation: *See—*
Anthony, John, 4,513,038, Cl. 428-35.000.
Beckman, John H., 4,512,059, Cl. 17-45.000.
Fuderer, Andrija, 4,512,780, Cl. 55-26.000.
Kamp, Ewald A., 4,513,445, Cl. 383-87.000.
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,512,875, Cl. 208-114.000.
Wary, John, 4,513,023, Cl. 427-54.100.
Wegman, Richard W.; and Busby, David C., 4,513,151, Cl. 568-484.000.
Union Oil Company of California: *See—*
Angmorter, Paul K.; Simpson, Howard D.; and Richardson, Ryden L., 4,513,097, Cl. 502-211.000.
Young, Dean A.; and Koepke, Jeffery W., 4,513,158, Cl. 585-527.000.
Young, Donald C., 4,512,813, Cl. 134-27.000.
Union Special GmbH: *See—*
Rohr, Gunter H., 4,512,268, Cl. 112-63.000.
Uniroyal Inc.: *See—*
Kohrn, Robert C., 4,512,834, Cl. 156-138.000.
United States of America
Air Force: *See—*
Buholz, Neal E., 4,513,422, Cl. 372-29.000.
Roeder, Allan W., 4,513,428, Cl. 375-120.000.
Roeder, Allan W., 4,513,429, Cl. 375-120.000.
Army: *See—*
Drzewiecki, Tadeusz M.; Toda, Kenji; and Gurney, John, 4,512,371, Cl. 137-828.000.
Dunn, Aubrey J., 4,513,434, Cl. 378-85.000.
Goodall, Steve R.; Dubowicz, Palemon W.; and Campbell, Donn V., 4,513,338, Cl. 361-1.000.
Maher, Robert A., 4,513,448, Cl. 455-265.000.
Marcus, Ira R., 4,513,064, Cl. 428-582.000.
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,512,639, Cl. 350-418.000.
Schwenk, Tyrone D., 4,512,488, Cl. 220-2.200.
Weathers, Glenn D.; and Holliday, Edward M., 4,513,288, Cl. 343-17.2PC.
Energy: *See—*
Anstine, Larry D.; James, Dean B.; Melaika, Edward A.; and Peterson, John P., Jr., 4,512,921, Cl. 252-626.000.
Bennett, Gloria A.; Elder, Michael G.; and Kemme, Joseph E., 4,513,352, Cl. 361-385.000.
Milewski, John V., 4,513,030, Cl. 427-227.000.
Szwarc, Raphael, 4,512,960, Cl. 423-219.000.
National Aeronautics and Space Administration: *See—*
Bunker, James W.; and Ritchie, Robert S., 4,512,678, Cl. 403-15.000.
Claus, Richard O.; and Turner, Tyson M., 4,512,661, Cl. 356-351.000.
Jackson, L. Robert; Davis, Randall C.; and Taylor, Allan H., 4,512,699, Cl. 411-368.000.
Katz, Joseph; Yariv, Amnon; and Margalit, Shlomo, 4,513,423, Cl. 372-50.000.
Lansing, Fikry L., 4,512,332, Cl. 126-415.000.
Ruoff, Carl F., Jr., 4,513,317, Cl. 358-133.000.
Shlichta, Paul J., 4,512,846, Cl. 156-623.00Q.
Navy: *See—*
Addamiano, Arrigo; and Klein, Philipp H., 4,512,825, Cl. 148-175.000.
Giuliani, John F.; and Wohltjen, Henry, 4,513,087, Cl. 436-96.000.
Goldberg, Lawrence S., 4,512,660, Cl. 356-301.000.
Gomez, Aldan D.; and Gennetten, Edward W., 4,513,329, Cl. 360-42.000.
Greene, Richard F.; and Gray, Henry F., 4,513,308, Cl. 357-55.000.
Hannan, Patrick J.; Stiffey, Arthur V.; Jarvis, N. Lynn; and Wohltjen, Henry, 4,513,280, Cl. 340-632.000.
Kretschmer, Frank F., 4,513,289, Cl. 343-17.2PC.
Mohon, Windell N.; and Harris, William T., 4,512,745, Cl. 434-43.000.
Nauflett, George W., 4,513,148, Cl. 564-109.000.
von Gutfeld, Robert J.; and Wang, Sherman S., 4,512,197, Cl. 73-643.000.
U.S. Philips Corporation: *See—*
Breimer, Hendrik; Van Roessel, Frederik J.; and Tienkamp, Engbert, 4,513,319, Cl. 358-163.000.
Dekker, Cornelis B.; and Vries, Lodewijk B., 4,513,315, Cl. 358-86.000.
Louttit, Duncan R., 4,513,443, Cl. 455-52.000.
Minnis, Brian J., 4,513,263, Cl. 333-204.000.
Schofield, John; and Milsom, Robert F., 4,513,262, Cl. 333-194.000.
Sieben, Joannes H. F. C., 4,512,470, Cl. 206-387.000.
Teuling, Dirk J. A., 4,513,228, Cl. 315-408.000.
Veendrick, Hendrikus J. M.; Pfennings, Leonardus C. M. G.; Raven, Johannes G.; and Nillesen, Antonius H. H. J., 4,513,388, Cl. 364-736.000.
Verweel, Jan; and Zijlstra, Hinne, 4,513,272, Cl. 335-284.000.
Weiss, Hermann; Linde, Rolf; Tiemens, Ulf; and Klotz, Erhard, 4,513,433, Cl. 378-2.000.
U.S. Plastics Corporation: *See—*
Hill, Clinton W., 4,513,183, Cl. 200-61.45R.
United States Surgical Corporation: *See—*
Green, David T., 4,512,345, Cl. 128-325.000.
United Technologies Corporation: *See—*
Baran, Walter J., Jr., 4,512,712, Cl. 415-116.000.
Duhl, David N.; Chen, Otis Y.; and Gell, Maurice L., 4,512,817, Cl. 148-3.000.

Grantham, Daniel H., 4,513,348, Cl. 361-283.000.
Luczak, Francis J., 4,513,094, Cl. 502-101.000.
Memmen, Robert L., 4,512,159, Cl. 60-752.000.
Miller, Robert J., 4,512,115, Cl. 51-289.00R.
Stargardter, Hans, 4,512,718, Cl. 416-231.00B.
Striebel, Edmund E.; Matthews, John A.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,512,158, Cl. 60-740.000.

University of Akron, The: *See—*
Koser, Gerald F.; and Carman, Carol S., 4,513,137, Cl. 546-14.000.

University of California, Regents of the: *See—*
Hunt, Thomas K.; Goodson, William H., III; Chang, Ning; Knighton, David R.; Gottrup, Finn; and Firmin, Richard, 4,512,349, Cl. 128-632.000.

University of Delaware: *See—*
Hicks, Douglas C.; and Pleass, Charles M., 4,512,886, Cl. 210-170.000.

University of Edinburgh, The University Court of the: *See—*
Lewis, Jeffrey M. O., 4,512,366, Cl. 137-527.800.

University of Medicine and Dentistry of New Jersey: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,512,038, Cl. 3-1.900.

Unroe, Marilyn R.: *See—*
Reinhardt, Bruce A.; Arnold, Fred E.; and Unroe, Marilyn R., 4,513,131, Cl. 526-285.000.

Uppgren, John J., to FMC Corporation. Mold registration apparatus. 4,512,385, Cl. 164-364.000.

Ury, Frank, to Brandtjen & Kluge, Inc. Folder unit with means for simultaneous phase shifting of front and rear spiral sets. 4,512,561, Cl. 270-40.000.

Uschold, Ronald E., to Du Pont de Nemours, E. I., and Company. Fluorinated vinyl ether copolymers having low glass transition temperatures. 4,513,128, Cl. 526-212.000.

USM Corporation: *See—*
Ettinger, Donald H., 4,513,193, Cl. 219-98.000.
Herdeg, Donald F.; and Matseas, William G., 4,512,271, Cl. 112-158.00E.

Usui, Masaji, to Mitsubishi Denki Kabushiki Kaisha. Protective relay for power system. 4,513,344, Cl. 361-113.000.

Uuskallio, Arvo F., to Briggs & Stratton Corp. Gas cap assembly. 4,512,499, Cl. 220-374.000.

Uyeda, Tim M., to La Gard, Inc. High security padlock. 4,512,165, Cl. 70-32.000.

Uzrad, Mordechay, to Mifalei Matechet Naan. Sprinkler. 4,512,519, Cl. 239-381.000.

Va. Inc.: *See—*
Pasquarella, Stephen T., 4,513,345, Cl. 361-155.000.

Vacanti, Eugene J., to Sports Marketing, Inc. Protective pad assembly. 4,512,037, Cl. 2-2.000.

Vacuum Furnace Systems Corporation: *See—*
Pierce, Clifford R., 4,512,737, Cl. 432-205.000.

Vailancourt, Vincent L., to Whitman Medical Corporation. Catheter valve. 4,512,766, Cl. 604-169.000.

Valayil, Silvester; Abu-Moustafa, Magda; and Benjamin, Terry A., to Shipley Company Inc. Solution for formation of black oxide. 4,512,818, Cl. 148-6.14R.

Valeo: *See—*
Villeval, Denis, 4,512,396, Cl. 165-104.320.

VanBreemen, Bertram, to RCA Corporation. Rear projection television screen incorporating a prism lens. 4,512,631, Cl. 350-128.000.

Vandekeybus, Christiaan A. C. Device for tying-up an animal. 4,512,287, Cl. 119-147.00R.

van de Locht, Heinrich, to BHS-Dr. Ing Hofler, Maschinenbau GmbH. Rolling gear apparatus for an involute tooth gear cutting machine. 4,512,109, Cl. 51-123.00G.

van der Lely, Cornelis. Row-crop front and rear wheel drive articulated tractor for heavy-duty operations. 4,512,433, Cl. 180-235.000.

Vanderwal, Frank E., Jr.; and Davis, James K., to Sunnen Products Company. Feed-up means for expandable work engaging members. 4,512,116, Cl. 51-347.000.

Van Dore, Peter: *See—*
Crossley, David W.; and Van Dore, Peter, 4,512,483, Cl. 213-75.0TC.

van Ee, Dirk; and Benning, Larry J. Heat exchange apparatus. 4,512,392, Cl. 165-54.000.

VanHulle, Glenn J.: *See—*
Blake, Jon R.; Knutson, Richard K.; and VanHulle, Glenn J., 4,513,016, Cl. 426-554.000.

van Kreuningen, Rudolf, to Kraco Enterprises. 8-Track cassette adaptor. 4,513,335, Cl. 360-94.000.

Van Loveren, Augustinus G.: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,512,902, Cl. 252-8.600.

van Marle, Berend P.: *See—*
Alink, Aloysius J. W. O.; and van Marle, Berend P., 4,512,759, Cl. 494-14.000.

Vann, Roy R.; George, Flint R.; and Warren, Dennis F., to GEO Vann, Inc. Bar actuated vent assembly. 4,512,406, Cl. 166-297.000.

Van Ouwerkerk, Anton: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,512,902, Cl. 252-8.600.

Van Pool, Joe. Alkylation process. 4,513,165, Cl. 585-723.000.

Van Roessel, Frederik J.: *See—*
Breimer, Hendrik; Van Roessel, Frederik J.; and Tienkamp, Engbert, 4,513,319, Cl. 358-163.000.

Varian Associates, Inc.: *See—*
Borden, Peter G., 4,513,168, Cl. 136-244.000.
Chodorow, Marvin, 4,513,223, Cl. 315-4.000.
Harra, David J., 4,512,391, Cl. 165-48.00R.
Liebert, Reuel B.; and Russo, Carl J., 4,512,812, Cl. 134-21.000.
Vora, Mahasukh; and Malhotra, Rajender, 4,513,430, Cl. 377-39.000.

Varwig, Juergen: *See—*
Seufert, Walter; Varwig, Juergen; Husslein, Gerd; Seppelt, Wolfgang; and Adolphi, Heinrich, 4,512,984, Cl. 514-147.000.

Vasold, Thomas A.: *See—*
Moore, William H.; Mandel, Alan F.; Trosky, William J.; Eichler, Kenneth M.; Tomas, Stephen P.; Tober, Edward; and Vasold, Thomas A., 4,512,442, Cl. 187-29.00R.

Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Chlorosulfonated polyethylene coating composition. 4,513,060, Cl. 428-416.000.

Vayenas, Costas G.; and Teague, Catherine E., to Massachusetts Institute of Technology. Method for forming nitric oxide from ammonia. 4,512,964, Cl. 423-403.000.

Veba Oel Entwicklungs-Gesellschaft mbH: *See—*
Escher, Gert; Holighaus, Rolf; and Wenning, Hans-Peter, 4,512,873, Cl. 208-13.000.

Veendrick, Hendrikus J. M.; Pfennings, Leonardus C. M. G.; Raven, Johannes G.; and Nillesen, Antonius H. H. J., to U.S. Philips Corporation. Electronic device for the execution of a mathematical operation on sets of three digital variables. 4,513,388, Cl. 364-736.000.

Vera, Samuel I.: *See—*
Gilbert, Clark J.; Hassialis, Menelaos D.; Scrymgeour, Andrew H.; and Vera, Samuel I., 4,512,610, Cl. 299-13.000.

Vereinigte Edelstahlwerke Aktiengesellschaft (VEW): *See—*
Kos, Bernd, 4,512,804, Cl. 75-123.00N.

Vernois, Michel; and Duboeuf, Jean-Paul, to Arjomari-Prioux. Cellulosic materials rendered transparent. 4,513,056, Cl. 428-264.000.

Verweel, Jan; and Zijlstra, Hinne, to U.S. Philips Corporation. Devices for manufacturing a magnetic quadrupole post-focusing mask. 4,513,272, Cl. 335-284.000.

Vesnier, Patrick H.: *See—*
Pennel, Jean-Francois; and Vesnier, Patrick H., 4,512,176, Cl. 72-367.000.

Vetter, Heinz: *See—*
Kaube, Peter; Schanz, Karl-Heinz; Vetter, Heinz; and Muller, Jens, 4,513,048, Cl. 428-188.000.

Victor Company of Japan, Ltd.: *See—*
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; and Tanaka, Koji, 4,513,327, Cl. 358-310.000.

Victor Slicing Systems S.r.l.: *See—*
Tarcisio, Re, 4,512,228, Cl. 83-355.000.

Vigano , Giovanni, to PLASTIVER S.a.s. di Giovanni e Vittorio VIGANO & C. Device and method for spread applying liquids, in particular glue over book spines. 4,512,945, Cl. 264-263.000.

Vilchek, Andrew, deceased; and by Trindl, Mary F., executrix. Escape apparatus. 4,512,438, Cl. 182-43.000.

Villeval, Denis, to Valeo. Water box including a degassing passage, and a heat exchanger including such a water box. 4,512,396, Cl. 165-104.320.

Vilter Manufacturing Corporation: *See—*
Kocher, Erich J., 4,512,550, Cl. 251-214.000.

Vinoxen Company, Inc., The: *See—*
Revici, Emanuel; Sherwood, Bob E.; Benecke, Herman P.; Rice, John M.; and Geisler, Richard W., 4,513,008, Cl. 514-560.000.

Viriyayuthakorn, Montri: *See—*
Astfalk, Greg; Dougherty, Timothy S.; and Viriyayuthakorn, Montri, 4,512,944, Cl. 264-174.000.

Vivitar Corporation: *See—*
Orban, John M., 4,513,238, Cl. 320-23.000.

Volakakis, Dinos G. Rotisserie cooker. 4,512,248, Cl. 99-341.000.

von Gutfeld, Robert J.; and Wang, Sherman S., to United States of America, Navy. Apparatus for generating a focusable and scannable ultrasonic beam for non-destructive examination. 4,512,197, Cl. 73-643.000.

Von Holdt, John W. Molded bucket and lid having high stack strength. 4,512,493, Cl. 220-306.000.

Von Holdt, John W. Plastic container having tongue and groove retention. 4,512,494, Cl. 220-307.000.

von Seggern, Heinz; and Wang, Tsuey T., to AT&T Bell Laboratories. Polarizing of piezoelectric material. 4,512,941, Cl. 264-22.000.

Vora, Madhukar B., to Fairchild Camera & Instrument Corporation. Method of making an integrated injection logic cell having self-aligned collector and base reduced resistance utilizing selective diffusion from polycrystalline regions. 4,512,075, Cl. 29-577.00C.

Vora, Mahasukh; and Malhotra, Rajender, to Varian Associates, Inc. Missing or broken wafer sensor. 4,513,430, Cl. 377-39.000.

Vries, Lodewijk B.: *See—*
Dekker, Cornelis B.; and Vries, Lodewijk B., 4,513,315, Cl. 358-86.000.

Vyne, Robert L., to Motorola, Inc. Miller compensation for an operational amplifier. 4,513,251, Cl. 330-292.000.

W. R. Grace & Co.: *See—*
Hansson, P. E. Anders; and Jachimowicz, Felek, 4,513,122, Cl. 525-332.300.
Hansson, Per E. A.; and Jachimowicz, Felek, 4,513,121, Cl. 525-332.300.
Peters, Alan W.; Kim, Gwan; and Ernest, Michael V., 4,513,101, Cl. 502-304.000.
Young, Kenneth E.; Dudley, Hubert T.; and Frohlich, Robert T., 4,512,128, Cl. 52-361.000.

Wada, Takeo: *See*—
Matsuura, Kazumi; and Wada, Takeo, 4,512,962, Cl. 423-331.000.

Wada, Takuo: *See*—
Ohyama, Hiroshi; Morita, Ken; Wada, Takuo; and Miyahara, Masahiko, 4,512,989, Cl. 514-383.000.

Wader, Heribert, to Deutsche Perlite GmbH. Apparatus for the expansion of mineral matter, especially perlite and vermiculite. 4,512,736, Cl. 432-58.000.

Wagener, Dietrich; and Blase, Manfred, to Didier Engineering GmbH. Method and apparatus for measuring the flexure of a heating wall of a coke oven during operation thereof. 4,512,080, Cl. 33-125.00T.

Wagner, Horst: *See*—
Poetsch, Dieter; Massmann, Volker; Becker, Werner; and Wagner, Horst, 4,513,324, Cl. 358-214.000.

Walker, Francis H., to Stauffer Chemical Company. Haloacetylaminomethyl dioxolane herbicide antidotes. 4,512,796, Cl. 71-88.000.

Walker, Jerry L.: *See*—
Myers, John G.; Logan, Douglas P.; and Walker, Jerry L., 4,512,774, Cl. 44-51.000.

Wallace Murray Corporation: *See*—
Marr, Louise C.; and Bremer, Robert C., Jr., 4,512,716, Cl. 415-205.000.

Wallace, William E.; and Pourarian, Faiz, to Koppers Company, Inc. Hydrogen storage materials of hyperstoichiometric alloys. 4,512,965, Cl. 423-644.000.

Wallmark, Erik I.: *See*—
Edlund, Olof A.; Enser, Mats A.; Strage, Jan W.; Thunberg, Svante B.; and Wallmark, Erik I., 4,513,393, Cl. 364-900.000.

Walsdorfer, Hubert: *See*—
Dulken, Hartmut; Kassel, Karlheinz; Mows, Wolfgang; and Walsdorfer, Hubert, 4,513,072, Cl. 430-57.000.

Walston, Everett V., to Beaver Products, Inc. Panel module means. 4,512,126, Cl. 52-251.000.

Walter, Gerard O.; and Sheppard, William D., to Planning Research Corporation. System for digital transmission and synthesis of integrated data. 4,513,390, Cl. 364-900.000.

Walters, John, to Lucas Industries. Float operated electrical switch assembly. 4,513,185, Cl. 200-84.00C.

Wang, Donald G. J., to Celanese Corporation. Process for the production of semipermeable polybenzimidazole membranes and the resultant product. 4,512,894, Cl. 210-500.200.

Wang, Jia T.: *See*—
Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., 4,512,815, Cl. 148-1.500

Wang, Sherman S.: *See*—
von Gutfeld, Robert J.; and Wang, Sherman S., 4,512,197, Cl. 73-643.000.

Wang, Tsuey T.: *See*—
von Seggern, Heinz; and Wang, Tsuey T., 4,512,941, Cl. 264-22.000.

Waniek, Kurt; and Tichy, Heinz, to Semperit Aktiengesellschaft. Antistatic support. 4,513,046, Cl. 428-156.000.

Ward, Randall W. Free-standing flexible container for fluids. 4,512,463, Cl. 206-216.000.

Warner-Lambert Company: *See*—
Carroll, Thomas J.; Corsello, Vincent G.; Glass, Michael; and Piccolo, Dominic J., 4,513,012, Cl. 426-5.000.

Warren, Dennis F.: *See*—
Vann, Roy R.; George, Flint R.; and Warren, Dennis F., 4,512,406, Cl. 166-297.000.

Wartenberg, Erwin W. Apparatus for coating plate-shaped bodies of glazed ceramic (tiles), glass or enamel. 4,512,282, Cl. 118-666.000.

Wary, John, to Union Carbide Corporation. Method of constructing thin electroluminescent lamp assemblies. 4,513,023, Cl. 427-54.100.

Wassermesserfabrik ANDRAE GmbH & Co.: *See*—
Konrad, Peter; and Mechel, Adam, 4,512,201, Cl. 73-861.790.

Watanabe, Hiromi, to Oppama Kogyo Kabushiki Kaisha. Ignition time controlling device in contactless ignition devices for internal combustion engines. 4,512,303, Cl. 123-335.000.

Watanabe, Masami, to Kashima Oil Company Limited. Method for producing mesophase continuously. 4,512,874, Cl. 208-44.000.

Watanabe, Naomitsu: *See*—
Morita, Yasukazu; and Watanabe, Naomitsu, 4,513,024, Cl. 427-65.000.

Watanabe, Toshimitu; Sakai, Masayuki; Minami, Kazutoshi; and Takumi, Shigeji, to Toyota Jidosha Kabushiki Kaisha. Vehicle air duct construction using center console box. 4,512,239, Cl. 98-2.030.

Wataya, Seiji: *See*—
Sakamoto, Toshiyuki; and Wataya, Seiji, 4,512,314, Cl. 123-459.000.

Waterman, Harold J., Jr., to Chandler Evans Inc. Rifle buttstock assembly. 4,512,101, Cl. 42-71.00R.

Waters, John H., to Dowty Mining Equipment Limited. Roof support suitable for use in mines. 4,512,686, Cl. 405-293.000.

Waters, Robert F.: *See*—
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., 4,513,096, Cl. 502-185.000.

Wattier, Maurice F., to Equipements Automobiles Marchal. Windscreen wiper system. 4,512,056, Cl. 15-250.230.

Waynant, Ronald W.; Epp, Leonard; and Christensen, Clad P., Jr. Laser pumped by X-band microwaves. 4,513,424, Cl. 372-68.000.

Weadock, Glenn E., to Wetzel Enterprises, Inc. Solar powered fluid heating system. 4,512,157, Cl. 60-641.800.

Weathers, Glenn D.; and Holliday, Edward M., to United States of America, Army. Group-complementary code sets for implementing pulse-compression processing with optimum aperiodic autocorrelation and optimum cross-correlation properties. 4,513,288, Cl. 343-17.2PC.

Weaver, Paul E. Oil well pumping unit. 4,512,149, Cl. 60-371.000.

Webb, Vertis C.: *See*—
Dines, David R.; and Webb, Vertis C., 4,512,707, Cl. 414-404.000.

Wedco Incorporated: *See*—
Feder, Friedhelm R., 4,512,732, Cl. 425-222.000.

Wedemeyer, Robert C.; and Giebeler, Robert H., Jr., to Beckman Instruments, Inc. Thermoelectric temperature control assembly for centrifuges. 4,512,758, Cl. 494-13.000.

Wedemeyer, Robert C.: *See*—
Wright, Herschel E.; and Wedemeyer, Robert C., 4,512,202, Cl. 73-863.000.

Wegman, Richard W.; and Busby, David C., to Union Carbide Corporation. Acetaldehyde process. 4,513,151, Cl. 568-484.000.

Weinstein, Raymond P., to Home Care Industries, Inc. Top loading upright vacuum cleaner bag and method of manufacturing the same. 4,512,788, Cl. 55-374.000.

Weiss, Andrew B.: *See*—
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,512,038, Cl. 3-1.900.

Weiss, Hermann; Linde, Rolf; Tiemens, Ulf; and Klotz, Erhard, to U.S. Philips Corporation. Fluoroscopy apparatus for forming layer images of a three-dimensional object. 4,513,433, Cl. 378-2.000.

Weitz, Hans-Martin: *See*—
Fischer, Rolf; Weitz, Hans-Martin; and Siegel, Hardo, 4,513,150, Cl. 568-385.000.

Welch, Albert B., to LTV Aerospace and Defense Company. Peripheral gain suppression in a laser medium. 4,513,421, Cl. 372-24.000.

Weldy, Piper: *See*—
Hodes, David S.; Leidy, Grace; Sprunt, Katherine; and Weldy, Piper, 4,513,083, Cl. 435-68.000.

Weller, Harold N., III; Gordon, Eric M.; Karanewsky, Donald S.; and Ryono, Denis E., to E. R. Squibb & Sons, Inc. Acylamino oxo or hydroxy substituted alkylamino thiazines and thiazepines. 4,512,988, Cl. 514-211.000.

Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., to Minnesota Mining and Manufacturing Company. Integrated cardioplegia delivery system. 4,512,163, Cl. 62-394.000.

Wennerberg, Arnold N.: *See*—
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., 4,513,096, Cl. 502-185.000.

Wenning, Hans-Peter: *See*—
Escher, Gert; Holighaus, Rolf; and Wenning, Hans-Peter, 4,512,873, Cl. 208-13.000.

Weppner, Werner: *See*—
Kreuer, Klaus-Dieter; Weppner, Werner; and Rabenau, Albrecht, 4,513,069, Cl. 429-192.000.

Werner, Jack E.: *See*—
Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., 4,512,163, Cl. 62-394.000.

West, Chester R. Storage receptacle for electronic storage media. 4,512,469, Cl. 206-387.000.

Western Publishing Company, Inc.: *See*—
Propsom, George F., 4,512,584, Cl. 273-282.000.

Westinghouse Electric Corp.: *See*—
Cricchi, James R., 4,513,309, Cl. 357-42.000.
Faulkner, James V., Jr., 4,513,382, Cl. 364-492.000.
Ghrist, William D., III, 4,512,185, Cl. 73-118.000.
Moore, William H.; Mandel, Alan F.; Trosky, William J.; Eichler, Kenneth M.; Tomas, Stephen P.; Tober, Edward; and Vasold, Thomas A., 4,512,442, Cl. 187-29.00R.
Novak, Paul G.; and Specht, Theodore R., 4,513,243, Cl. 323-361.000.
Putman, Thomas H., 4,513,240, Cl. 323-210.000.
Safiuddin, Mohammed, 4,513,232, Cl. 318-341.000.
Sriram, Sambamurthy; Steinbruegge, Kenneth; and Supertzi, Emmanuel, 4,512,638, Cl. 350-372.000.
Thomas, Robert L., 4,513,186, Cl. 200-144.00B.

Westly, Pernie E.; and Leder, Uri, to Sanders Associates, Inc. Convertible platen for graphics plotter. 4,512,505, Cl. 226-101.000.

Westvaco Corporation: *See*—
Keesee, Kenneth C.; and Ruckman, James A., 4,512,132, Cl. 52-742.000.

Wetzel Enterprises, Inc.: *See*—
Weadock, Glenn E., 4,512,157, Cl. 60-641.800.

Whang, Sung-Hyun, to Northeastern University. Precipitate hardened titanium alloy composition and method of manufacture. 4,512,826, Cl. 148-407.000.

Wheatley, William T., to Lucas Industries, plc. Fuel treatment device. 4,512,884, Cl. 210-136.000.

Whipple, David L.: *See*—
Ziegler, Michael L.; Marshall, Peter G.; and Whipple, David L., 4,513,372, Cl. 364-200.000.

Whipple, Donald E.: *See*—
Ready, Robert J.; Whipple, Donald E.; and Sferra, James P., 4,512,098, Cl. 40-610.000.

Whitman Medical Corporation: *See*—
Vailancourt, Vincent L., 4,512,766, Cl. 604-169.000.

Wichterle, Otto, to SPOFA, spojene podniky pro zdravotnickou vyrobu. Apparatus for planarizing and storing hydrophilic contact lens. 4,512,461, Cl. 206-5.100.

Widerby, Lennart, to Flakt Aktiebolag. Exhaust air valve. 4,512,356, Cl. 137-75.000.

Wiegers, Wilhelmus J.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Perfumery uses of phenyl alkanols. 4,512,918, Cl. 252-522.00R.

Wiener, Murray, to Babcock & Wilcox Company, The. Panel of vapor generating and superheating tubes. 4,512,336, Cl. 126-442.000.

Wilcox, Jeffrey S.; and Nienhuis, James H., to Herman Miller, Inc. Static protective chair. 4,513,347, Cl. 361-212.000.

Wild, Keith R., to British Gas Corporation. Purification of aqueous effluents. 4,512,777, Cl. 48-210.000.

Wilensky, Barry F.; and Maggi, Joseph A., to Allied Corporation. Programmable video test pattern generator for display systems. 4,513,318, Cl. 358-139.000.

Wm. Steinen Mfg. Co.: *See*—
Kuzma, Gregory S., 4,512,358, Cl. 137-116.000.

Williams, Donald F. Adjustable canoe pontoons. 4,512,277, Cl. 114-364.000.

Williams, James E., to Cuisinarts, Inc. Single vertical motion feedtube protector and actuator for a food processor. 4,512,522, Cl. 241-37.500.

Williams, Keith R., to Sundstrand Corporation. Pressure limiter. 4,512,723, Cl. 417-222.000.

Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., to Lucas Industries Limited. Internal combustion engine. 4,512,319, Cl. 123-492.000.

Williams, Tommy A. Book support system. 4,512,603, Cl. 294-137.000.

Willinger, Allan H., to Willinger Bros., Inc. Aquarium filter assembly. 4,512,885, Cl. 210-136.000.

Willinger Bros., Inc.: *See*—
Willinger, Allan H., 4,512,885, Cl. 210-136.000.

Willoughby, John C., to Foam-Lag Industries Pty. Ltd.; and P.C.H. Constructions Pty. Ltd. Apparatus for roof flashing. 4,512,119, Cl. 52-58.000.

Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. 2-Methoxy-4-(2-methylpropenyl) phenyl ester of isobutyric acid, and use in augmenting or enhancing aroma of perfume compositions, colognes and perfumed articles. 4,512,919, Cl. 252-522.00R.

Wilson Sporting Goods Co.: *See*—
Martin, Robin A., 4,513,058, Cl. 428-336.000.

Wilson, William P.; Hewlett, Catherine M.; and Rieben, Werner P., to General Electric Company. Customization window for a computer numerical control system. 4,513,379, Cl. 364-474.000.

Wimmer, Warren K.: *See*—
Lamb, James S.; and Wimmer, Warren K., 4,513,417, Cl. 371-12.000.

Winkelmann, Detlef, to Hoechst Aktiengesellschaft. Electrophotographic copier. 4,512,658, Cl. 355-14.0SH.

Winkler, Ernel R.: *See*—
Schroeder, Jack A.; and Winkler, Ernel R., 4,513,355, Cl. 361-403.000.

Winter, William E., Jr.: *See*—
Eberly, Paul E., Jr.; and Winter, William E., Jr., 4,513,090, Cl. 502-66.000.

Winther Family Members: *See*—
Winther, Harry C., 4,512,278, Cl. 116-34.00R.

Winther, Harry C., to Winther Family Members. Vehicle tire deflation signalling system. 4,512,278, Cl. 116-34.00R.

Wirth, Emil J., Jr., to Pfizer Inc. Wire injection apparatus. 4,512,800, Cl. 75-53.000.

Wisconsin Alumini Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lee, Seok-Ho, 4,512,925, Cl. 260-397.200.

Wiseman, John A.: *See*—
Davis, Michael I.; Garrett, Michael J.; and Wiseman, John A., 4,513,351, Cl. 361-384.000.

Wissler, Josef H., to Max Planck Gesellschaft Zur Forderung der Wissenschaften. Chemorecruitins of leukocytes and inflamed tissues. 4,512,970, Cl. 424-85.000.

Wissler, Josef H., to Max Planck Gesellschaft Zur Forderung der Wissenschaften. Mitogens of leukocytes and inflamed tissues. 4,512,971, Cl. 424-85.000.

Witkowski, Andrew B.: *See*—
Egan, John J.; and Witkowski, Andrew B., 4,512,299, Cl. 123-196.00A.

Wittmer, Paul: *See*—
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,513,105, Cl. 521-56.000.

Wohltjen, Henry: *See*—
Giuliani, John F.; and Wohltjen, Henry, 4,513,087, Cl. 436-96.000.
Hannan, Patrick J.; Stiffey, Arthur V.; Jarvis, N. Lynn; and Wohltjen, Henry, 4,513,280, Cl. 340-632.000.

Wong, David T.; and Lacefield, William B., to Eli Lilly and Company. Diaryl-pyrazine derivatives affecting GABA binding. 4,513,135, Cl. 544-120.000.

Wong, Victor W., to Cummins Engine Company, Inc. Method and apparatus for removing carbon particles from engine exhausts. 4,512,147, Cl. 60-274.000.

Woodward, Stewart A.; Hilty, Ronald L.; and Stoll, Donald H., to General Electric Company. Transducer. 4,512,199, Cl. 73-725.000.

Wopker, Wilhelm: *See*—
Suetterlin, Norbert; Arndt, Peter J.; Heil, Ernst; Siol, Werner; Tilch, Willi; and Wopker, Wilhelm, 4,513,118, Cl. 525-81.000.

Worthington, Thomas K.: *See*—
Chainer, Timothy J.; Scranton, Robert A.; and Worthington, Thomas K., 4,513,437, Cl. 382-3.000.

Wright, Danny O.: *See*—
Pauwels, Michael A.; Wright, Danny O.; Harvey, Bruce J.; and Bauer, Thomas J., 4,512,317, Cl. 123-478.000.

Wright, David B., to Olin Corporation. Method of monitoring pH. 4,512,853, Cl. 204-1.00T.

Wright, Franklin J.; Richard, Michael A.; and Pirkle, James C., to Exxon Research and Engineering Co. Process using iron-thallium catalysts in CO hydrogenation. 4,513,104, Cl. 518-714.000.

Wright, Herschel E.; and Wedemeyer, Robert C., to Beckman Instruments, Inc. Pregrooved centrifuge tubes. 4,512,202, Cl. 73-863.000.

Wright, Mervin E.; and Gronholz, Donald D., to Donaldson Company, Inc. Pleated filter element with controlled expansibility and frame therefor. 4,512,891, Cl. 210-445.000.

Wu, Mu T.: *See*—
Patchett, Arthur A.; and Wu, Mu T., 4,512,979, Cl. 514-2.000.

Wuerzer, Bruno: *See*—
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,512,797, Cl. 71-93.000.

Wunsch, Richard E. Manifold for controlling administration of multiple intravenous solutions and medications. 4,512,764, Cl. 604-80.000.

Wurttembergische Metallwarenfabrik AG.: *See*—
Bauer, Ewald; and Krejza, Jurgen, 4,512,495, Cl. 220-316.000.

Wyle, Charles; and Shea, Donald M., to Charles Wyle Engineering Corporation. Method and apparatus for applying solvent to tubing, other cylindrical objects or other flexible material. 4,512,947, Cl. 264-343.000.

Xerox Corporation: *See*—
Borriello, Gaetano; Lyon, Richard F.; and Bell, Alan G., 4,513,427, Cl. 375-110.000.
Brueggemann, Harry P., 4,512,625, Cl. 350-6.800.
Buck, Kenneth J.; Grace, Robert E.; and Hayes, Thomas A., Jr., 4,512,652, Cl. 355-14.0CH.
Huggins, Raymond W., 4,513,404, Cl. 367-93.000.
Jansen, Frank; and Mort, Joseph, 4,513,022, Cl. 427-39.000.
Leder, Lewis B., 4,513,031, Cl. 427-250.000.
Nash, Robert J.; and Randall, Kent A., 4,513,074, Cl. 430-106.600.

Yagishita, Teruo: *See*—
Narusawa, Toshiaki; Okada, Seiji; Muramatsu, Kiyohide; Yagishita, Teruo; and Okuyama, Hirofumi, 4,513,075, Cl. 430-108.000.

Yale University: *See*—
Gershoni, Jonathan M., 4,512,896, Cl. 210-635.000.

Yamada, Junichi: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,512,404, Cl. 166-274.000.

Yamada, Naoki: *See*—
Uchigaki, Takatoshi; Saito, Akio; and Yamada, Naoki, 4,512,348, Cl. 128-632.000.

Yamada, Yasuaki: *See*—
Kikukawa, Noriyuki; and Yamada, Yasuaki, 4,513,236, Cl. 318-696.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Asaba, Takao, 4,512,152, Cl. 60-601.000.
Sugiyama, Keiichi, 4,512,311, Cl. 123-432.000.

Yamakawa, Toru, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine provided with a plurality of power units. 4,512,301, Cl. 123-198.00F.

Yamamoto, Naoki: *See*—
Kishida, Kazuo; Yamamoto, Naoki; Nishida, Kozi; Narita, Toshihito; and Sato, Yasumasa, 4,513,111, Cl. 524-458.000.

Yamamuro, Sigeaki: *See*—
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,512,751, Cl. 474-28.000.

Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, to Sumitomo Electric Industries, Ltd. Method for coating optical transmission glass fibers. 4,512,281, Cl. 118-627.000.

Yamasaki, Kazuyuki; and Kagawa, Fukashi, to Mitsui Petrochemical Industries, Ltd. Electret article. 4,513,049, Cl. 428-194.000.

Yamatani, Yoshiichi. Intensifier. 4,512,151, Cl. 60-581.000.

Yamato, Akihiro, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for multi cylinder internal combustion engines after termination of fuel cut. 4,512,321, Cl. 123-493.000.

Yamato Mishin Seizo Kabushiki Kaisha: *See*—
Nozaki, Keizo, 4,512,270, Cl. 112-140.000.

Yamauchi, Masakatu, to Tanica Electric Co., Ltd.; and Tomei Sangyo Kabushiki Kaisha. Electrolytic sterilizer for contact lenses. 4,512,865, Cl. 204-271.000.

Yamazaki, Kaoru; and Shibuya, Fukashi, to Konegafuchi Kagaku Kogyo Kabushiki Kaisha. Acrylonitrile polymer, process for the preparation thereof and fiber prepared therefrom. 4,513,126, Cl. 526-87.000.

Yamazaki, Keiji, to Minolta Camera Kabushiki Kaisha. Automatic diaphragm control and mirror release devices for cameras. 4,512,647, Cl. 354-441.000.

Yano, Hiroshi: *See*—
Fujimura, Shuzo; and Yano, Hiroshi, 4,512,868, Cl. 204-298.000.

Yao, Keith C.: *See*—
Reid, Lloyd E.; Yao, Keith C.; and Ryan, Douglas G., 4,512,878, Cl. 208-179.000.

Yariv, Amnon: *See*—
Katz, Joseph; Yariv, Amnon; and Margalit, Shlomo, 4,513,423, Cl. 372-50.000.

Yen, Kuo-Hsiung; Stokes, Robert B.; Lau, Kei-Fung; Kong, Alvin M.; and Kagiwada, Reynold S., to TRW Inc. Low-loss acoustic wave filter device. 4,513,261, Cl. 333-194.000.

Yeou, Victor: *See*—
Boichu, Claude P.; and Yeou, Victor, 4,512,708, Cl. 414-694.000.

Yokogawa, Fumihiko, to Pioneer Electronic Corporation. Variable impedance circuit. 4,513,242, Cl. 323-352.000.

Yokono, Hitoshi: *See*—
Shoji, Fusaji; Takemoto, Issei; Kataoka, Fumio; Yokono, Hitoshi; and Isogai, Tokio, 4,513,132, Cl. 528-21.000.

Yokoyama, Tatsuo, to Fujitsu Ten Limited. DC current detector. 4,513,245, Cl. 324-119.000.

Yoo, Sin Y. Aerodynamic bass-reflex enclosure. 4,512,434, Cl. 181-146.000.

Yoshida, Kenichi: *See*—
Kita, Yasuo; Moriya, Michio; and Yoshida, Kenichi, 4,512,615, Cl. 303-97.000.

Yoshida, Kobun, to Pioneer Electronic Corporation. Cassette tape recorder. 4,513,336, Cl. 360-105.000.

Yoshida Kogyo K.K.: *See*—
Nishikawa, Kiyotada, 4,512,064, Cl. 24-429.000.

Yoshida, Masaaki, to Canon Kabushiki Kaisha. Flash device. 4,512,644, Cl. 354-149.100.

Yoshida, Masaaki: *See*—
Yamanishi, Toru; Tsuneishi, Katsuyuki; and Yoshida, Masaaki, 4,512,281, Cl. 118-627.000.

Yoshikawa, Kazuo: *See*—
Aoyama, Shigetsune; Yoshikawa, Kazuo; Hasegawa, Yoshimichi; and Higuchi, Junichi, 4,512,559, Cl. 267-47.000.

Yoshimura, Kunimasa: *See*—
Nakano, Hiromichi; Sasaya, Hideaki; Inagaki, Mitsuo; Matsui, Kazuma; and Yoshimura, Kunimasa, 4,512,728, Cl. 418-3.000.

Yoshinari, Shigeru: *See*—
Tsuboshima, Kosaku; and Yoshinari, Shigeru, 4,512,852, Cl. 204-1.00T.

Yoshioka, Toshiharu, to Honda Giken Kogyo Kabushiki Kaisha. Front fork reinforcing structure in motor bicycle or the like. 4,512,592, Cl. 280-279.000.

Young, Dean A.; and Koepke, Jeffery W., to Union Oil Company of California. Polymerization and oligomerization with catalytically active amorphous silica. 4,513,158, Cl. 585-527.000.

Young, Donald C., to Union Oil Company of California. Method for treating wooden articles. 4,512,813, Cl. 134-27.000.

Young, Ronald E.; and Meulners, Duane C., to Dymek Corporation. Diagnostic recording. 4,513,333, Cl. 360-77.000.

Ysidro, Leonard M., Sr.: *See*—
Foust, Julian D.; Ysidro, Leonard M., Sr.; and Cross, Danny R., 4,512,701, Cl. 414-101.000.

Zaar, Wolfgang: *See*—
Hanssle, Peter; and Zaar, Wolfgang, 4,513,157, Cl. 585-378.000.

Zampino, Michael J.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,512,919, Cl. 252-522.00R.

Zandona, Oliver J.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,513,093, Cl. 502-84.000.

Zaneveld, Lourens J. D.; and Burns, James W. P., to Zaneveld, Lourens J. D.; and Burns, James W. P. Device and method for reversibly occluding a body duct. 4,512,342, Cl. 128-303.00R.

Zeigler, Theodore R. Display panel mounting clip. 4,512,097, Cl. 40-611.000.

Zenith Electronics Corporation: *See*—
Reneau, Daniel L.; Tzakis, George J.; and Engel, Christopher M., 4,513,320, Cl. 358-166.000.

Zevatron GmbH, Gesellschaft fur Fertigungseinrichtungen der Elektronik: *See*—
Pachschwoll, Heino, 4,512,508, Cl. 228-180.100.

Ziegler, Michael L.; Marshall, Peter G.; and Whipple, David L., to Data General Corporation. Universal memory. 4,513,372, Cl. 364-200.000.

Ziels, Burton D.: *See*—
Ayres, Paul S.; Ziels, Burton D.; and Chen, Chou-Ming, 4,512,721, Cl. 417-51.000.

Zijlstra, Hinne: *See*—
Verweel, Jan; and Zijlstra, Hinne, 4,513,272, Cl. 335-284.000.

Zimmermann, John, to Somerville Belkin Industries Limited. Divided display container. 4,512,511, Cl. 229-15.000.

Zinser Textilmaschinen GmbH: *See*—
Hartmannsgruber, Max; Kriechbaum, Kurt; Schulz, Gunter; and Guttler, Hermann, 4,512,061, Cl. 19-239.000.

Zirk, Elisabeth: *See*—
Olschewski, Armin; Herrmann, Gerhard; Bauer, Bernhard; and Zirk, Elisabeth, 4,512,672, Cl. 384-477.000.

Ziv, Pinhas; and Ng, Yiu-Keung, to Amdahl Corporation. Data transfer control system and method for a plurality of linked stations. 4,513,370, Cl. 364-200.000.

Zscheile, John W., Jr.: *See*—
Pike, Lawrence W.; Zscheile, John W., Jr.; and Spencer, Billie M., 4,513,285, Cl. 343-5.0PN.

Zurek, Rudolf: *See*—
Molzer, Peter; Pollner, Jurgen; Topic, Nicola; Trummer, Gregor; and Zurek, Rudolf, 4,512,560, Cl. 269-20.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Wicanders Korkfabriker: *See*—
Harding, Sune, Re. 31,869, Cl. 215-254.000.

Cohen, Sam G., to Timex Corporation. Electro-optical display with circuitry for applying predetermined potentials to all display segments to effect activation of a selected segment only. Re. 31,872, Cl. 340-784.000.

Ernst Reiner, KG Feinmechanik und Apparatebau: *See*—
Wagner, Friedemann, Re. 31,870, Cl. 101-110.000.

Exxon Research and Engineering Co.: *See*—
Venero, Agustin F., Re. 31,871, Cl. 429-15.000.

Harding, Sune, to AB Wicanders Korkfabriker. Bottle caps. Re. 31,869, Cl. 215-254.000.

Timex Corporation: *See*—
Cohen, Sam G., Re. 31,872, Cl. 340-784.000.

Venero, Agustin F., to Exxon Research and Engineering Co. Metal halogen batteries and method of operating same. Re. 31,871, Cl. 429-15.000.

Wagner, Friedemann, to Ernst Reiner, KG Feinmechanik und Apparatebau. Means for yieldably coupling a shaft to counter wheels or the like. Re. 31,870, Cl. 101-110.000.

LIST OF DESIGN PATENTEES

Adams, Bert G.; and Manna, Patrick J., to Economics Laboratory, Inc. Bottle. 278,515, 4-23-85, Cl. D9-403.000.

Akro Corporation, The: *See*—
Reuben, Harold, 278,564, Cl. D92-25.000.

Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., to AT&T Technologies, Inc. Telephone stand. 278,534, 4-23-85, Cl. D14-60.000.

Anderson, George C., to Insilco Corporation. Container. 278,561, 4-23-85, Cl. D32-53.000.

Ando, Tetsuro, to KabushikiKaisha Taikodenki Seisakusho. Telephone. 278,533, 4-23-85, Cl. D14-53.000.

AT&T Technologies, Inc.: *See*—
Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., 278,534, Cl. D14-60.000.
McGarvey, John N.; and Tilley, Alvin R., 278,531, Cl. D14-53.000.

Ateliers Reunis S.A.: *See*—
Kervan, Gilbert, 278,518, Cl. D10-32.000.

AXIA Incorporated: *See*—
Schroeder, Versell H.; Sterling, Alton H.; and Rozenberg, Josef H., 278,538, Cl. D15-72.000.

B and B Marketing and Development Inc.: *See*—
Bain, Leroy D.; and Risch, Murray J., 278,554, Cl. D24-17.000.

Backstrom, Dixie C. Physical exerciser. 278,548, 4-23-85, Cl. D21-191.000.

Bain, Leroy D.; and Risch, Murray J., to B and B Marketing and Development Inc. Otoscope. 278,554, 4-23-85, Cl. D24-17.000.

Baird, Robert W.; and Hopper, Patricia. Two part flower container. 278,521, 4-23-85, Cl. D11-153.000.

Bayly, Peter K., to Roplas Pty. Ltd. Foldable chair or the like. 278,486, 4-23-85, Cl. D6-368.000.

Bevilacqua, Ernest; and Knerr, Theodore, to Bost Enterprises, Inc. Golf bag. 278,479, 4-23-85, Cl. D3-37.000.

Blank, Cecil G., to Flow Systems. Automatic battery water filler. 278,550, 4-23-85, Cl. D23-17.000.

Bost Enterprises, Inc.: *See*—
Bevilacqua, Ernest; and Knerr, Theodore, 278,479, Cl. D3-37.000.

Brescia, Anthony; and Deacon, Ross, to Syroco Inc. Combined horizontal storage unit and display board. 278,493, 4-23-85, Cl. D6-570.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,472, 4-23-85, Cl. D2-40.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,473, 4-23-85, Cl. D2-40.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,474, 4-23-85, Cl. D2-40.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,475, 4-23-85, Cl. D2-40.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,476, 4-23-85, Cl. D2-41.000.

Byrd, Karl G., Sr. Decalomania or similar article. 278,545, 4-23-85, Cl. D20-11.000.

C.S. di NOSENZO Oreste: *See*—
Nosenzo, Oreste G., 278,552, Cl. D23-97.000.

Caldwell Corporation: *See*—
Caldwell, Samuel C., 278,519, Cl. D10-114.000.

Caldwell, Samuel C., to Caldwell Corporation. Safety light. 278,519, 4-23-85, Cl. D10-114.000.

Caven, Terence T., to Plessey Overseas Limited. Console for a data terminal. 278,536, 4-23-85, Cl. D14-106.000.

Celebrity China Company: *See*—
McCluhan, Darrell, 278,494, Cl. D6-436.000.

Charcoal Service Corporation: *See*—
Cherry, John L., 278,553, Cl. D23-149.000.

Cherry, John L., to Charcoal Service Corporation. High-efficient charcoal filter or the like. 278,553, 4-23-85, Cl. D23-149.000.

Cillario, Lorenzo, to Ferrero S.p.A. Container for food products. 278,516, 4-23-85, Cl. D9-425.000.

Coats & Clark, Inc.: *See*—
Dunn, James R., 278,544, Cl. D19-91.000.

Conair Corporation: *See*—
Pajak, Witold, 278,557, Cl. D28-13.000.

Corley, Betty J. Picture holder. 278,498, 4-23-85, Cl. D6-309.000.

Crossman, Ray. Relief valve. 278,551, 4-23-85, Cl. D23-19.000.

Cummings, Jack D. Picture lamp. 278,555, 4-23-85, Cl. D26-60.000.

Cwik, Norbert L., to Quaker Industries, Inc. Mobile storage rack for tray tables. 278,562, 4-23-85, Cl. D34-26.000.

Dart Industries Inc.: *See*—
Wolff, Martin J., 278,501, Cl. D7-19.000.

Davis, Robert P.: *See*—
Katz, Ira R.; and Davis, Robert P., 278,480, Cl. D3-71.000.

Deacon, Ross: *See*—
Brescia, Anthony; and Deacon, Ross, 278,493, Cl. D6-570.000.

Ditgen, Earl N. Combination toothbrush and cover thereof. 278,481, 4-23-85, Cl. D4-104.000.

Duderstadt, Christopher. Child's rocker. 278,484, 4-23-85, Cl. D6-348.000.

Dunn, James R., to Coats & Clark, Inc. Message memo holder. 278,544, 4-23-85, Cl. D19-91.000.

Ebeling, Wade M.; and Thayer, Arnold A. Compartmented pill container. 278,513, 4-23-85, Cl. D9-339.000.

Economics Laboratory, Inc.: *See*—
Adams, Bert G.; and Manna, Patrick J., 278,515, Cl. D9-403.000.

Eghamn, Lars. Calf guard. 278,470, 4-23-85, Cl. D2-27.000.

Ely, Edmund E. Chair. 278,485, 4-23-85, Cl. D6-365.000.

Englishtown Sportswear, Ltd.: *See*—
Heinfling, Martin, 278,471, Cl. D2-28.000.

Ferrero S.p.A.: *See*—
Cillario, Lorenzo, 278,516, Cl. D9-425.000.

Firestone Tire & Rubber Company, The: *See*—
Molnar, Joseph F.; and Wallet, Bill J., 278,524, Cl. D12-147.000.

Flow Systems: *See*—
Blank, Cecil G., 278,550, Cl. D23-17.000.

Frem Corporation: *See*—
Howitt, Robert T., 278,563, Cl. D34-40.000.

Fujitsu Limited: *See*—
Kakiuchi, Yoshinori; and Watari, Masami, 278,542, Cl. D18-4.000.

Gintz, Richard A. Display notebook. 278,543, 4-23-85, Cl. D19-27.000.

Giugiaro, Giorgetto, to Nihom Melber Kabushiki Kaisha. Vehicle wheel. 278,526, 4-23-85, Cl. D12-204.000.

Giugiaro, Giorgetto, to Nihon Melber Kabushiki Kaisha. Vehicle wheel. 278,527, 4-23-85, Cl. D12-204.000.

Gorenje- Tiki, Elektro Strojno Podjetje, p.o.: *See*—
Jerman, Bojan, 278,504, Cl. D7-324.000.

Gottfried, Mario H. Electric motor. 278,528, 4-23-85, Cl. D13-1.000.

Haas, Charles A.: *See*—
Shenken, John E.; and Haas, Charles A., 278,558, Cl. D6-309.000.

Hamtak, Frank. Multifunction necklace container. 278,520, 4-23-85, Cl. D11-2.000.

Hardesty, Gary A. Electronic circuit control rack module. 278,522, 4-23-85, Cl. D13-12.000.

Hartmann Luggage Company: *See*—
Katz, Ira R.; and Davis, Robert P., 278,480, Cl. D3-71.000.

Hausman, Marcian C. Easel for prone individual. 278,496, 4-23-85, Cl. D6-310.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 278,471, 4-23-85, Cl. D2-28.000.

Hickory Furniture Works, Inc.: *See*—
Welsh, Bobby J., 278,487, Cl. D6-369.000.

Hoogner, Richard L., to Security Switch, Ltd. Security light switch with built-in time display and on/off switch or a similar article. 278,529, 4-23-85, Cl. D13-32.000.

Hooker Furniture Corporation: *See*—
West, Haywood L., 278,488, Cl. D6-508.000.

Hoover Company, The: *See*—
Wareham, Richard A., 278,560, Cl. D32-22.000.

Hopper, Patricia: *See*—
Baird, Robert W.; and Hopper, Patricia, 278,521, Cl. D11-153.000.

Howitt, Robert T., to Frem Corporation. Combined stackable and nestable bin. 278,563, 4-23-85, Cl. D34-40.000.

Insilco Corporation: *See*—
Anderson, George C., 278,561, Cl. D32-53.000.

International Business Machines Corporation: *See*—
Josephson, Paul J.; and Lykins, Larry W., 278,539, Cl. D16-32.000.

Jerman, Bojan, to Gorenje- Tiki, Elektro Strojno Podjetje, p.o. Portable solar oven. 278,504, 4-23-85, Cl. D7-324.000.

Josephson, Paul J.; and Lykins, Larry W., to International Business Machines Corporation. Toner cartridge. 278,539, 4-23-85, Cl. D16-32.000.

KabushikiKaisha Taikodenki Seisakusho: *See*—
Ando, Tetsuro, 278,533, Cl. D14-53.000.

Kadar, Gabor. Bottled liquid dispenser. 278,503, 4-23-85, Cl. D7-301.000.

Kafka, Barbara. Kitchen appliance. 278,506, 4-23-85, Cl. D7-376.000.

Kafka, Barbara P. Kitchen appliance base. 278,508, 4-23-85, Cl. D7-386.000.

Kakiuchi, Yoshinori; and Watari, Masami, to Fujitsu Limited. Point of sale terminal. 278,542, 4-23-85, Cl. D18-4.000.

Katz, Ira R.; and Davis, Robert P., to Hartmann Luggage Company. Luggage. 278,480, 4-23-85, Cl. D3-71.000.

Kervan, Gilbert, to Ateliers Reunis S.A. Wristwatch. 278,518, 4-23-85, Cl. D10-32.000.

Knerr, Theodore: *See*—
Bevilacqua, Ernest; and Knerr, Theodore, 278,479, Cl. D3-37.000.

Koper, Barry R. Facial appliance for makeup. 278,546, 4-23-85, Cl. D21-190.000.

Koper, Barry R. Facial appliance for makeup. 278,547, 4-23-85, Cl. D21-190.000.

Kowa Shoji Kabushiki Kaisha: *See*—
Mori, Kashichi, 278,507, Cl. D7-381.000.

Krapowicz, Jacob; Smith, Douglas W.; and Laude, Michael E., to Toro Company, The. Snow thrower. 278,537, 4-23-85, Cl. D15-12.000.

Kristich, John, to Kristy Creations, Inc. Cage-shaped swing. 278,549, 4-23-85, Cl. D21-246.000.

Kristy Creations, Inc.: *See*—
Kristich, John, 278,549, Cl. D21-246.000.

Latham, Peter A.; and Sabean, Peter J., to Opus, Inc. Bird feeder. 278,559, 4-23-85, Cl. D30-15.000.

Laude, Michael E.: *See*—
Krapowicz, Jacob; Smith, Douglas W.; and Laude, Michael E., 278,537, Cl. D15-12.000.

Lewis Woolf Griptight Limited: *See*—
Moore, Ronald K., 278,514, Cl. D9-341.000.

Lojko, Jozef. Holder for spackle. 278,512, 4-23-85, Cl. D8-71.000.

Lykins, Larry W.: *See*—
Josephson, Paul J.; and Lykins, Larry W., 278,539, Cl. D16-32.000.

Mackin, Edward H., to Maverick Industries, Inc. Portable barbecue grill. 278,505, 4-23-85, Cl. D7-337.000.

Manna, Patrick J.: *See*—
Adams, Bert G.; and Manna, Patrick J., 278,515, Cl. D9-403.000.

Marvin Glass & Associates: *See*—
Rivette, Denni F.; and Terzian, Rouben T., 278,532, Cl. D14-53.000.

Maverick Industries, Inc.: *See*—
Mackin, Edward H., 278,505, Cl. D7-337.000.

McCluhan, Darrell, to Celebrity China Company. Display unit for china and crystal or the like. 278,494, 4-23-85, Cl. D6-436.000.

McGarvey, John N.; and Tilley, Alvin R., to AT&T Technologies, Inc. Housing for a telephone or similar article. 278,531, 4-23-85, Cl. D14-53.000.

Middleton, Gary C.; and Smith, Kenneth R., to Middleville Tool & Die Co. Bottle cap opener. 278,509, 4-23-85, Cl. D8-18.000.

Middleville Tool & Die Co.: *See*—
Middleton, Gary C.; and Smith, Kenneth R., 278,509, Cl. D8-18.000.

Milin, Ivan. Combined bottle top and bottle opener. 278,517, 4-23-85, Cl. D9-437.000.

Miller Manufcturing Company: *See*—
Powell, Edward A., Jr., 278,502, Cl. D7-77.000.

Mizuno, Masao. Shirt. 278,477, 4-23-85, Cl. D2-208.000.

Molnar, Joseph F.; and Wallet, Bill J., to Firestone Tire & Rubber Company, The. Tire. 278,524, 4-23-85, Cl. D12-147.000.

Moore, Ronald K., to Lewis Woolf Griptight Limited. Packaging container. 278,514, 4-23-85, Cl. D9-341.000.

Morawski, Janusz. Floor mat for a vehicle. 278,525, 4-23-85, Cl. D12-203.000.

Mori, Kashichi, to Kowa Shoji Kabushiki Kaisha. Pineapple cutter. 278,507, 4-23-85, Cl. D7-381.000.

Morris, Charles. Clarinet thumb rest. 278,540, 4-23-85, Cl. D17-13.000.

Nihom Melber Kabushiki Kaisha: *See*—
Giugiaro, Giorgetto, 278,526, Cl. D12-204.000.

Nihon Melber Kabushiki Kaisha: *See*—
Giugiaro, Giorgetto, 278,527, Cl. D12-204.000.

Nosenzo, Oreste G., to C.S. di NOSENZO Oreste. Stove. 278,552, 4-23-85, Cl. D23-97.000.

Opus, Inc.: *See*—
Latham, Peter A.; and Sabean, Peter J., 278,559, Cl. D30-15.000.

Pajak, Witold, to Conair Corporation. Styler dryer. 278,557, 4-23-85, Cl. D28-13.000.

Pardo, John: *See*—
Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., 278,534, Cl. D14-60.000.

Pioneer Electronic Corporation: *See*—
Takagi, You, 278,530, Cl. D14-30.000.

Plessey Overseas Limited: *See*—
Caven, Terence T., 278,536, Cl. D14-106.000.

Powell, Edward A., Jr., to Miller Manufcturing Company. Cooler box. 278,502, 4-23-85, Cl. D7-77.000.

Quaker Industries, Inc.: *See*—
Cwik, Norbert L., 278,562, Cl. D34-26.000.

Rafferty, George A., Sr. Barbeque skewer rack. 278,500, 4-23-85, Cl. D6-572.000.

Ragland, Larry L. Water bed frame. 278,489, 4-23-85, Cl. D6-382.000.

Rattner, Milton S. Display case. 278,495, 4-23-85, Cl. D6-470.000.

Reecher, Lorane K.; and Reecher, Sharman. Insulated ski boot jacket. 278,478, 4-23-85, Cl. D2-267.000.

Reecher, Sharman: *See*—
Reecher, Lorane K.; and Reecher, Sharman, 278,478, Cl. D2-267.000.

Reuben, Harold, to Akro Corporation, The. Carpet tile. 278,564, 4-23-85, Cl. D92-25.000.

Richelieu Electrics Corp.: *See*—
Toth, John J., 278,541, Cl. D17-14.000.

Risch, Murray J.: *See*—
Bain, Leroy D.; and Risch, Murray J., 278,554, Cl. D24-17.000.

Rivette, Denni F.; and Terzian, Rouben T., to Marvin Glass & Associates. Telephone. 278,532, 4-23-85, Cl. D14-53.000.

Rizla Limited: *See*—
Short, Walter R., 278,492, Cl. D6-518.000.

Roplas Pty. Ltd.: *See*—
Bayly, Peter K., 278,486, Cl. D6-368.000.

Rozenberg, Josef H.: *See*—
Schroeder, Versell H.; Sterling, Alton H.; and Rozenberg, Josef H., 278,538, Cl. D15-72.000.

Rubel, Kenneth L. Spotlight for video camera. 278,556, 4-23-85, Cl. D26-63.000.

Sabean, Peter J.: *See*—
Latham, Peter A.; and Sabean, Peter J., 278,559, Cl. D30-15.000.

Schoeberlein, Allan. Wrench. 278,510, 4-23-85, Cl. D8-28.000.

Schroeder, Versell H.; Sterling, Alton H.; and Rozenberg, Josef H., to AXIA Incorporated. Pump and oil reservoir housing for a sewing machine or the like. 278,538, 4-23-85, Cl. D15-72.000.

Security Switch, Ltd.: *See*—
Hoogner, Richard L., 278,529, Cl. D13-32.000.

Shannon, Walter. Combined record carrousel and storage unit. 278,499, 4-23-85, Cl. D6-407.000.

Shenken, John E.; and Haas, Charles A. Covered vanity mirror. 278,558, 4-23-85, Cl. D6-309.000.

Short, Walter R., to Rizla Limited. Tissue dispenser. 278,492, 4-23-85, Cl. D6-518.000.

Smith, Douglas W.: *See*—
Krapowicz, Jacob; Smith, Douglas W.; and Laude, Michael E., 278,537, Cl. D15-12.000.

Smith, Kenneth R.: *See*—
Middleton, Gary C.; and Smith, Kenneth R., 278,509, Cl. D8-18.000.

Smith, Warren D. Hand seamer tool for standing seam roofs. 278,511, 4-23-85, Cl. D8-52.000.

Snyder, Martin H.: *See*—
Aldrich, Thomas B.; Pardo, John; and Snyder, Martin H., 278,534, Cl. D14-60.000.

Sterling, Alton H.: *See*—
Schroeder, Versell H.; Sterling, Alton H.; and Rozenberg, Josef H., 278,538, Cl. D15-72.000.

Stevens, Charles R. Bow rack. 278,490, 4-23-85, Cl. D6-462.000.

Sujanani, Vinod S., to Vhoom Systems Limited. AM/FM Foldable radio. 278,535, 4-23-85, Cl. D14-68.000.

Syroco Inc.: *See*—
Brescia, Anthony; and Deacon, Ross, 278,493, Cl. D6-570.000.

Takada, Juichiro. Child safety seat for vehicles. 278,482, 4-23-85, Cl. D6-333.000.

Takada, Juichiro. Child safety seat for vehicles. 278,483, 4-23-85, Cl. D6-333.000.

Takagi, You, to Pioneer Electronic Corporation. Loudspeaker. 278,530, 4-23-85, Cl. D14-30.000.

Terzian, Rouben T.: *See*—
Rivette, Denni F.; and Terzian, Rouben T., 278,532, Cl. D14-53.000.

Thayer, Arnold A.: *See*—
Ebeling, Wade M.; and Thayer, Arnold A., 278,513, Cl. D9-339.000.

Thompson, Bruce R. Soap holder. 278,491, 4-23-85, Cl. D6-536.000.

Tilley, Alvin R.: *See*—
McGarvey, John N.; and Tilley, Alvin R., 278,531, Cl. D14-53.000.

Toro Company, The: *See*—
Krapowicz, Jacob; Smith, Douglas W.; and Laude, Michael E., 278,537, Cl. D15-12.000.

Toth, John J., to Richelieu Electrics Corp. Electrical guitar. 278,541, 4-23-85, Cl. D17-14.000.

Tuley, A. Lester. Wheeled folding chair. 278,523, 4-23-85, Cl. D12-131.000.
Vhoom Systems Limited: *See*—
Sujanani, Vinod S., 278,535, Cl. D14-68.000.
Wallet, Bill J.: *See*—
Molnar, Joseph F.; and Wallet, Bill J., 278,524, Cl. D12-147.000.
Walpin, Arline. Pillow rack. 278,497, 4-23-85, Cl. D6-462.000.
Wareham, Richard A., to Hoover Company, The. Combined suction cleaner upper housing and bag or the like. 278,560, 4-23-85, Cl. D32-22.000.
Watari, Masami: *See*—
Kakiuchi, Yoshinori; and Watari, Masami, 278,542, Cl. D18-4.000.
Welsh, Bobby J., to Hickory Furniture Works, Inc. Chair. 278,487, 4-23-85, Cl. D6-369.000.
West, Haywood L., to Hooker Furniture Corporation. Headboard. 278,488, 4-23-85, Cl. D6-508.000.
Wolff, Martin J., to Dart Industries Inc. Bowl carrier or the like. 278,501, 4-23-85, Cl. D7-19.000.

LIST OF PLANT PATENTEES

Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lonforem. 5,444, 4-23-85, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Londelien. 5,445, 4-23-85, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lonsico. 5,446, 4-23-85, Cl. 73.000.
Barkan, Pinchas, to Kvutsat Schiller Kvutsat Ovdim Lehityashvut Shitufit Ltd. Avocado tree-Schiller. 5,442, 4-23-85, Cl. 44.000.
Ducloux, Yves: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,444, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,445, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,446, Cl. 73.000.
Duffett, William E.; and Mack, Grace H., to Mack, Grace H. Chrysanthemum plant named Remarkable. 5,447, 4-23-85, Cl. 82.000.
Fleming, Margaret M.: *See*—
Hesse, Peter S.; and Fleming, Margaret M., 5,443, Cl. 68.000.
Hesse, Peter S.; and Fleming, Margaret M., to Pan American Plant Company. Kalanchoe plant named Sonora. 5,443, 4-23-85, Cl. 68.000.
Kvutsat Schiller Kvutsat Ovdim Lehityashvut Shitufit Ltd.: *See*—
Barkan, Pinchas, 5,442, Cl. 44.000.
Laboratoire de Physiologie Vegetale de La Londe: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,444, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,445, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,446, Cl. 73.000.
Mack, Grace H.: *See*—
Duffett, William E.; and Mack, Grace H., 5,447, Cl. 82.000.
Pan American Plant Company: *See*—
Hesse, Peter S.; and Fleming, Margaret M., 5,443, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 23, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,512,037

CLASS 3

1.9 4,512,038
13 4,512,039
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CLASS 4

227 4,512,041
496 4,512,042
516 4,512,043
581 4,512,044
610 4,512,045
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CLASS 5

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CLASS 6

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CLASS 7

128 4,512,051

CLASS 8

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CLASS 12

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CLASS 19

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CLASS 24

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CLASS 33

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CLASS 37

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CLASS 40

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CLASS 47

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360 4,512,415
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CLASS 187

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CLASS 188

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73.38 4,512,446
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CLASS 203

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129.46 4,512,859
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192 R 4,512,863
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461 4,512,474
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632 4,512,479

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42.42 R 4,512,503
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CLASS 228

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263 4,512,945
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CLASS 266

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249 4,512,558

CLASS 267

47 4,512,559

CLASS 269

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CLASS 270

40 4,512,561
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CLASS 271

85 4,512,563
274 4,512,564
294 4,512,565

CLASS 272

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73 4,512,567
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126 4,512,571
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123 R 4,512,579
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168 4,512,583
282 4,512,584
410 4,512,585

CLASS 277

124 4,512,586
205 4,512,587

CLASS 280

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CLASS 285

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56 4,513,444

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168 4,512,715
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55 4,512,729

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19 4,513,065
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229 4,512,744

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71 4,513,091
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	310	278,496
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	407	278,499
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